Exhibit 12 Part 6

Part 2 of Attachment J to the Allocation Recommendation Report (ARR0772-ARR1178)

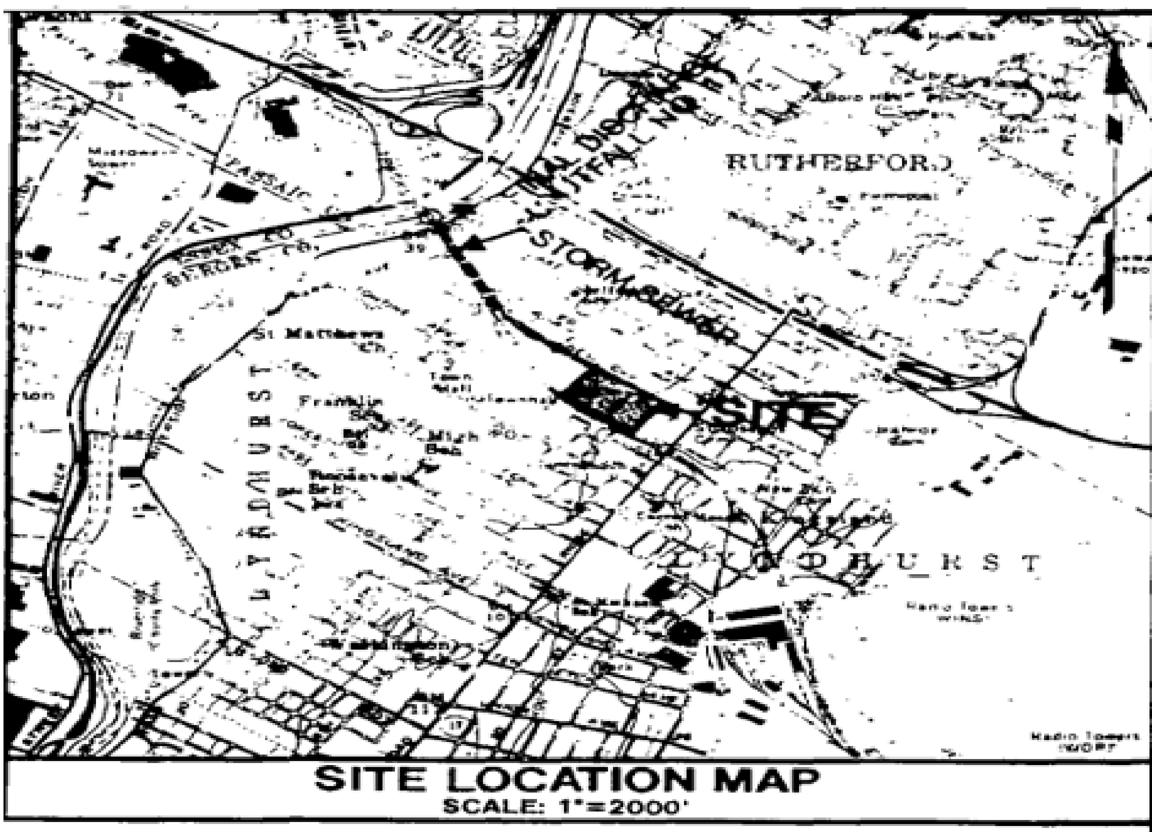
United States' Motion to Enter Consent Decree,
United States v. Alden Leeds, Inc. et al., Civil Action No. 22-7326 (D.N.J.)

Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

CONOPCO, Inc.
(as successor to Corn Productions Corporation (CPC) / Bestfoods, former parent of the Penick Corporation)

Facility Name, Address and Size: Conopco d/b/a Unilever (as successor to CPC/ Bestfoods, former parent of Penick Corporation), 540 New York Avenue, Lyndhurst, New Jersey. The site is located on 14 different Lot numbers that fall within Block Numbers: 2A, 3, 73, 79 and 83 (PAS-00112914); 17-acre site (PAP-00048761). The site is also referred to as 550 New York Avenue, Lyndhurst (PAS-00112742; PAS-00112829).

Over time the property grew and in the 1960's included the 550 New York Avenue portion of the parcel. The 1968, 1970 and 1973 New Jersey State Industrial Directories noted that S.B. Penick located at 550 New York Avenue employed 540 people (PAS-00112829, 32, 35). The 1984 MacRae's Industrial Directory for New Jersey listed the Penick Corp., affiliate of CPC North America, as employing 400 (PAS-00112838). Note: pre-1960 operations on the 550 New York Avenue portion of the property are not attributable to Conopco.



(PAS-00113059)

1. **Business Type:** Between 1941 and 1986, Penick manufactured chemicals at the facility, including botanical extracts, pharmaceutical-fine chemicals, acetaminophen, resmethrin, rodenticide, insecticides/pesticides, specialty chemicals and stearates (PAS-00113112, 2741, 3149; PAP-00048761).

2. Time Period of Ownership/Operations

Operator: 1941-1986 (PAS-00113143; PAS-00112922)
Owner: 1938/1941-February 10, 1986 (PAS-00112822, 2922; 3143).

1914: According to the Penick Corporation website, S.B. Penick, Sr. founded the company in Marion, North Carolina in 1914 where he made drugs of vegetable origin (PAS-00112759).

1938: According to a book, *American Chemical Industry*, dated 1949, edited by Williams Haynes and D. Van Nostrand Company Inc., in 1938, S. B. Penick & Company bought a 15-acre manufacturing plant with extensive research and control laboratories at Lyndhurst, New Jersey (PAS-00112822). Peter Trippett, Penick Corporation, sent an Initial ECRA Notice of Requirements letter to NJDEP on April 30, 1984 (PAS-00113138) that said prior to Penick's ownership, United Cork Works Company owned and operated Blocks 73, Lots 1 and 3 and Blocks 79, Lots 1 and 2 until approximately 1941 (PAS-00113141, 43). The Initial ECRA Notice described the site location on New York Avenue between Ridge Road and Delafield Avenue to the east and west respectively and bordered by the Erie Lackawanna Railroad to the south. There were two parking lots, an open storage field and 43 buildings (4 of which were warehouses, i.e., 11, 28, 38 and 39), three administrative/ technical buildings (4A, C, 30 and 44) one lunch room/cafeteria, and a maintenance area (PAS-00113149). The 1984 ECRA Notice said that a third parcel was purchased in 1959 from Lehmen Brothers, Inc., an engineering firm (PAS-00113143).

1941: According to a 1984 *Initial ECRA Notice of Requirements*, Penick operations began in approximately 1941 (PAS-00113143). According to the 1985 *Environmental Assessment (EA)*, since 1941, the Lyndhurst plant has been engaged in the production of numerous chemical products, including pharmaceutical formulations, specialty organic and botanical preparations, and pesticides. The original part of the plant, comprised of Buildings 1 through 15, engaged in manufacturing various organic chemicals and botanical preparations. Newer areas of the plant included warehouses (Buildings 11, 11A, 38, and 39) and pharmaceutical/pesticide manufacturing (Buildings 41A, 41B, 42 and 43) (PAS-00113112).

1949: According to the book, *American Chemical Industry*, S.B. Penick & Company produced pyrethrum for control of malaria in World War II and red squill to control diseased rats. They also produced emetine, atropine and homatropine, hyoscine, hyoscyamine, pilocarpine, serine, strophanthin, ouabain, arecoline and totaquine from cinchona bark (PAS-00112823).

1960s: The S.B. Penick Company was acquired in the mid 1960's (PAS-00112759) and operated at the facility until February 10, 1986, when the assets were sold (PAS-00113408). The Penick Corporation website noted that when a large multinational conglomerate corporation acquired the S. B. Penick Company, the company was broken up into many pieces with each being sold over a period of

about 20 years. The last remaining piece, Penick Pharmaceuticals, was sold to a private investor in 1988 (PAS-00112759).

1985: According to the response to the Administrative Order, on November 5, 1985, Penick informed NJDEP it had reached an agreement for sale of the facility to Standard Chlorine and Chemical Company and other affiliated companies owned by Louis P. Weiner and requested a permit for the sale to move forward. The response to the Administrative Order noted that in paragraph 4 of a Scheduling Agreement, it showed that all permits would be transferred to Standard Chlorine and Chemical Company, and they would be responsible for obtaining any other permits. The Standard Chlorine and Chemical Company ultimately formed Penco of Lyndhurst, Inc. (PAS-00113405). This sale included the acetaminophen and botanicals part of the business (PAS-00112771).

Roussel UCAF (a French-based company) purchased the Lyndhurst pesticide business from CPC in 1985 and called the new company Penick-Bio UCLAF (PAS-00112715).

1986: A Memorandum from Peter Trippett to Frank Sanchez, dated May 16, 1990, documented the sale of Penick Corporation to Penco of Lyndhurst on February 10, 1986 (PAS-00112922). A *Bureau of Environmental Evaluation and Cleanup Responsibility Assessment Industrial Site Recovery Act (ISRA), Report of Inspection of 540 New York Avenue, Lyndhurst, ISRA Case E93651*, dated August 6, 1997, confirmed Penco of Lyndhurst, Inc. owned and operated the facility in 1986, when they purchased the business and property from Penick Corporation. Penco of Lyndhurst, Inc. manufactured acetaminophen, resmethrin (a pesticide) and botanical extracts.

According to the Administrative Order response, a Purchase and Sale Agreement, dated February 10, 1986, documented Penick's agreement to sell all assets, including its interim status to Penco, and Penco agreed to purchase all buildings "as is" and indemnify Penick of any liabilities attributable to operation after closing (PAS-00113405).

1987: According to a Memorandum to Peter Trippett from Frank Sanchez, dated May 16, 1990, in 1987 CPC International removed all hazardous materials and wastes at the facility via appropriate manifests (PAS-00112922).

According to a publication, "The Record, Northern New Jersey," dated June 10, 1987, Roussel UCLAF, consolidated its Lyndhurst pesticide operations and 20 executives at 400 Sylvan Avenue, Englewood Cliffs in May 1987. CPC continued to own Penick Corporation (PAS-00112786).

1988: According to the Administrative Order response, CPC International sold all stock in Penick to Mayfair Pharmaceuticals, Inc. pursuant to an Agreement of Purchase and Sale of Stock, dated February 1, 1988. As part of the transaction, CPC agreed to assume Penick's ECRA obligations arising out of the asset sale to Penco. The arrangement was formalized in an amendment to the ACO, dated March 31, 1988 (PAS-00113406).

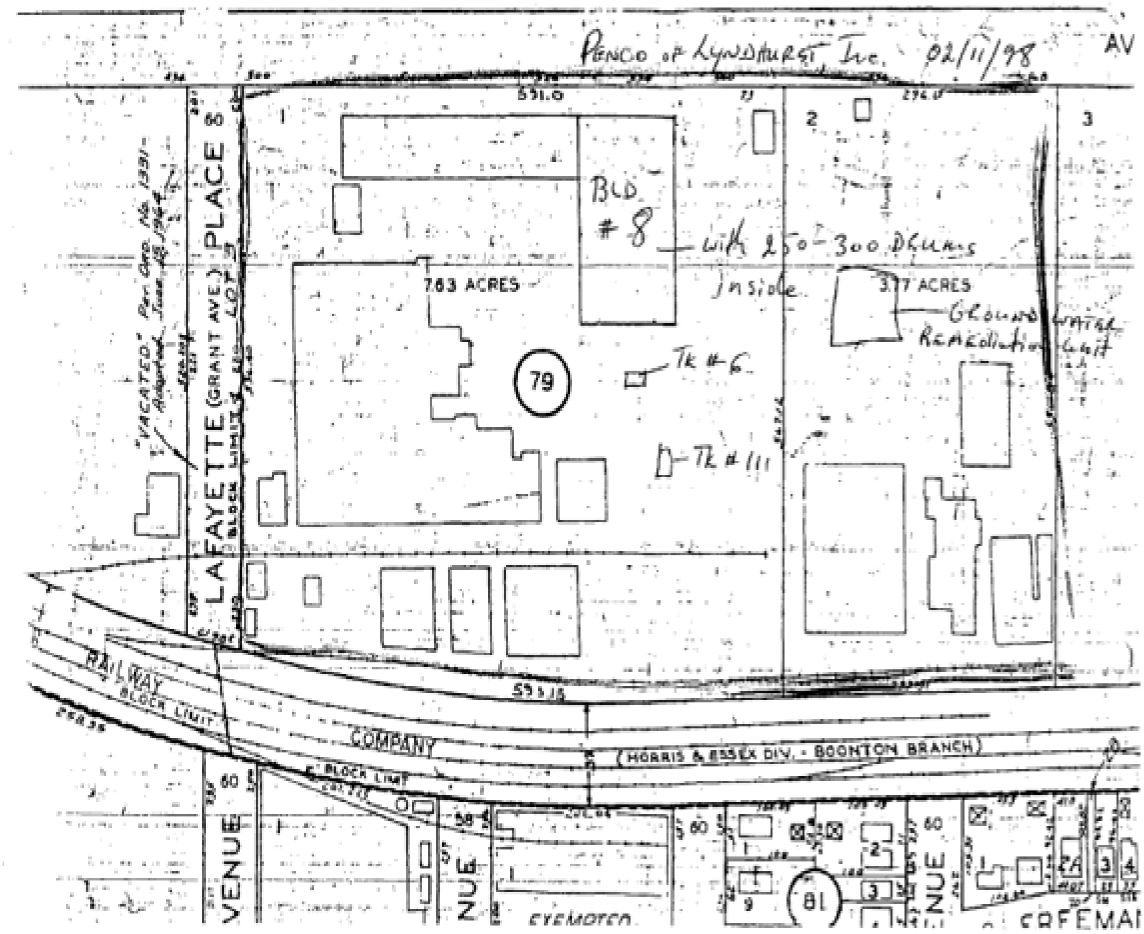
1991: Penco of Lyndhurst, Inc. filed for bankruptcy in 1991 (PAS-00112774).

1994: According to Penick Corporation website, Penick declared Chapter 11 Bankruptcy in 1994. In 1997 the Bankruptcy Court appointed a Trustee to run the company, whose job was to find a buyer (PAS-00112759). The publication, "The Record, Northern New Jersey," dated November 27, 1997, described the Penco chemical plant on New York Avenue, Lyndhurst, as a 17-acre abandoned, state-registered toxic waste site proposed to house a 60,000 square foot ShopRite (PAS-00112773).

1998: A Memo to File through Jeffrey Sterling from Boleslaw Czachor, dated February 13, 1998, documented a Site Remediation Progress Report for NJD 981 184-401 for 250 New York Avenue owned by Penco of Lyndhurst, Inc., described between 250 and 300 mostly 55-gallon drums in storage; some were observed to be in bad condition. The report described a noticeable organic odor at the entrance of the facility and that nothing had been done on two RCRA USTs, tanks 66 and 111, 50,000-gallon and 10,000-gallon, respectively. Mr. Czachor contacted Bennett Barnes, ISRA Case Manager, who informed Mr. Czachor that UST 66 had been surrendered to ISRA for closure, but the company had not submitted a closure plan. At the writing of the report, North Atlantic Properties, Ltd. owned the site (PAS-00112965-68). The facility layout at this time is shown on the map on the next page.

2000: According to the Penick Corporation website, in February 2000, Penick Holding, Inc., a group of individual investors with specific intentions to acquire Penick, received approval from the Court for a Reorganization Plan. Penick Holding, Inc. acquired the Penick Corporation and proceeded with plans to re-establish Penick's medicinal narcotics manufacturing businesses (PAS-00112759).

2005: According to a Dun and Bradstreet Comprehensive Report, Unilever is a division of Conopco, Inc. (PAS-00112750).



(PAS-00112969)

3. Operational History/COC Use and Presence at the Facility

The 1984 Initial ECRA Notice of Requirements contained an operational history which proceeded through three departments, Pesticides, Botanicals and Acetaminophen. Acetaminophen production occurred in Building 41 using acetic acid, anhydrous ammonia, sulfuric acid 66 Be’, and p-nitrophenol. Hydrogen was used to reduce p-nitrophenol to form p-aminopheno which was acetylated with acetic anhydride to form 4-hydroxyacetaninilide or acetaminophen. The compound was heated, crystalized, redissolved and crystallized again for a purer product. Wash water was processed through the plant pretreatment station (PAS-00113149).

Pesticides production occurred in Building 43 and formulations were prepared in Building 7. In 1984 the only bulk pesticide was resmethrin (tradename SBP-1382) otherwise known as (5-benzyl-3-furyl) methyl-1, 2, 2-dimethyl-3-(2-methyl propenyl) cyclopropane carboxylate. Raw materials required for production included benzyl cyanide, ethylene glycol, N-hepatane, methylene chloride, sulfuric acid 66 Be’, sulfuric acid 66 Be’ electrolyte, toluol 1 nitration, p-toluene sulfonic acid, isopropyl alcohol, methanol ACS, kerosene deodorized Baylor 90 and dimethyl succinate. Drums containing bulk material were stored in Building 28 (PAS-00113150).

The only pesticide produced in bulk was resmethrin, which took five stages to create. Carbinol was the precursor immediately preceding the resmethin final product. Intermediate steps produced Valerate and Furoate in that order which were isolated and not handled in an open system. Manufacturing produced two waste streams that were isolated for off-site disposal or treatment. 1) Spent toluene solvent obtained from an acid layer separation during the manufacture of Furoate was stored in vessel 66 while awaiting hazardous waste disposal through an approved private disposal firm. 2) The second waste stream was a solid at room temperature and was a "polymerized process tar" that was disposed as a hazardous waste through a private disposal firm (PAS-00113150-51).

According to the 1984 *Initial ECRA Notice of Requirements*, staff in Building 7 produced various grades and concentrations of active ingredients, i.e., a natural occurring pesticide isolated from the root of a south American Plant, Rotenone; Dursban; chlorpyrifos and a naturally occurring insecticide of plant origin, pyrethrum. Their formulations required deodorized kerosene and occasionally water (PAS-00113151).

Botanicals provided naturally occurring active ingredients for pharmaceuticals, cosmetics, flavors, fragrances industrial photographic emulsions and pesticides. The active ingredients may have been isolated by extraction, direct milling and/or a combination of both. The final products were packaged or further processed via spray drying, formulation, or air- drying. Extraction from the botanicals could either be aqueous or organic e.g., ethyl alcohol. Botanicals consisted of several diverse product lines (PAS-00113151).

According to the 1984 *Initial ECRA Notice of Requirements*, operations proceeded as follows:

- Building 2 – extraction and milling botanic products such as cascara and guarana
- Building 3 – milling, sifting and blending
- Building 9 – Tagetes[1] blending
- Building 13 – quillaia[2] and henna[3] production
- Buildings 12, 13 and 14 – piperidine ester manufacture; quassia purification; henna leaf extraction
- Building 16 – soap bark processing
- Building 19 – solvent recovery
- Building 22 – Rotenone extraction (PAS-00113152).

Raw materials considered as hazardous substances in the botanical operation included: ethyl alcohol, toluene, methanol acetone, heptane, isopropyl alcohol, hydrochloric acid, sulfuric acid, caustic, formaldehyde and calcium oxide. According to the 1984 *Initial ECRA Notice Requirements*, the only hazardous waste generated in these processes were waste solvents incorporated into below ground vessel No. 66 (PAS-00113152).

According to the February 1985 EA, since 1941, the Lyndhurst plant has been engaged in the production of numerous chemical products including pharmaceutical formulations, specialty organic and botanical preparations and pesticides. The original part of the plant

[1] Chicken feed
[2] Foaming agent
[3] Natural shampoo

comprised of Buildings 1 through 15 had engaged in the manufacture of various organic chemicals and botanical preparations since the plant's inception Newer areas of the plant include warehouses (Buildings 11, 11A, 28, 38, and 39) and the pharmaceutical / pesticide manufacturing complex (Buildings 41A, 41B, 42, and 43). Many of the chemicals were stored in above- and below-ground tanks and in 55-gallon drums in various locations. Prior to construction Buildings 38 and 39, the area occupied by Building 39 was used for storage of solvents in drums. Infrequently, materials were spilled or drums ruptured. The plant generated process wastewater that was discharged to sewer lines connected to an on-site industrial waste treatment plant. The wastewater was skimmed for oil and grease, neutralized with lime and discharged through the sewer line to the local publicly owned treatment works in Newark, New Jersey. As the wastewater left the plant at the northwest corner, the sewer routed it under the center of New York Avenue toward the Passaic River (PAS-00113112). Solid and liquid hazardous waste were stored in drums in the hazardous waste storage area to await pick up by an outside contractor. The plant generated hazardous waste under Permit NJ0081894842 (PAS-00113113).

A NJ Bureau of Environmental Evaluation and Cleanup Responsibility Assessment was triggered due to cessation of Penco of Lyndhurst, Inc.'s operations in 1993 and an agreement to sell the property to North Atlantic Properties, LLC, a New Jersey Limited Liability Company consistent with a Remediation Agreement dated January 31, 1997. The resultant Inspection Report stated that Penick Corporation (i.e., CPC International, Inc.) was conducting remediation at the site under ISRA case E84090. Upon arrival, the inspector noted the site was surrounded by fencing and was in a commercial and residential area. There were at least 20 structures, and one burnt to the ground and another partially burnt in June 1996. Walls were collapsing and nearly every building had been vandalized (PAS-00112971). Numerous drums and containers were seen located in numerous buildings that included, but were not limited to, 5, 6, 10, 27, 38, 39 and 43. Labeled contents were "speedydry" at "50 ppm and 150 ppm." These drums, along with a partially covered soil pile were attributed to ISRA Case E84090 (PAS-00112972).

According to the August 6, 1997, Inspection Report, globules and bubbling were observed in the wastewater at the pretreatment facility. Floor drains, trenches and sumps were present in storage and manufacturing buildings that involved hazardous substances include Buildings 4, 7, 15 and 16. The report documented significant staining on the floor of building 27 (a boiler room) and in the concrete near 30,000-gallon USTs 112 and 113 that contained 6 heating oil. UST 111 was empty, and UST 27 (2,000-gallon capacity) contained 2 fuel oil. Transformers were noted on second story walls in some buildings with at least one label indicating it contained PCBs. Pint size jars of reportedly radioactive material were noted in a closet in unsecured Building 18, a quality control building (PAS-00112972). Penco of Lyndhurst, Inc. was notified that sampling conducted under ISRA Case E84090 did not acceptably address areas of concern that had since been identified. Therefore, Penco of Lyndhurst, Inc. was to identify and address areas identified since ISRA Case E84090 (PAS-00112972-73).

The August 6, 1997, Inspection Report stated that USTs 112 and 113 were excavated in 1991 but had been re-contaminated with No. 6 fuel oil between April 26 and May 3, 1994 (PAS-00112973). Penco of Lyndhurst, Inc. was directed to address all issues identified in the Inspection Report and determine the extent of groundwater contamination (PAS-00112974).

According to an unnamed publication, dated November 26, 1997, as much as 10,000-gallons of toluene spilled from an underground tank in May 1981. The extent of the spill was unknown but was evidenced by tree defoliation in 1982 (PAS-00112776).

DDT, DDE

According to the 1984 Initial ECRA Notice of Requirements, Buildings 6, 7 and 43 were the locations of pesticide formulation, and inspection of Buildings 6 and 7 found DDT and a minute amount of DDE contamination (PAS-00113150, 156).

PAHs and Metals

There were underground storage tanks on-site that were used to store No. 2 and No. 6 fuel oil. There was also one tank used to store waste oil. No. 6 fuel oil was stored in Tanks 112 and 113 (both 30,000 gallons) (PAS-00112939). Both were reported to be in good condition with no significant corrosion or holes when removed in 1999 (PAS-00112939). Tanks 27, 114, and 119 held No. 2 fuel oil (size unknown) (PAS-00112989-90). The waste oil was stored in Tank 111 that had a capacity of 10,000 gallons (PAS-00112939). Fuel oil and waste oil typically contain PAHs and metals.

PCBs

According to an undated Regulatory Compliance Status (circa mid-1980's), nine transformers on-site were owned by the public utility. They were fenced in but accessible to Penick personnel. The utility informed Penick that the transformers contained PCBs at 50-500 ppm. Penick owned three transformers on-site; one of which contained PCBs at less than 50 ppm (PAP-00328085). According to a 1999 letter from NJDEP to a law firm, regarding a remediation agreement, prior to demolition of buildings on-site, PSE&G removed their last transformer. There was reportedly no evidence of stains or contamination beneath the transformers (PAS-00112940).

4. Identified COCs

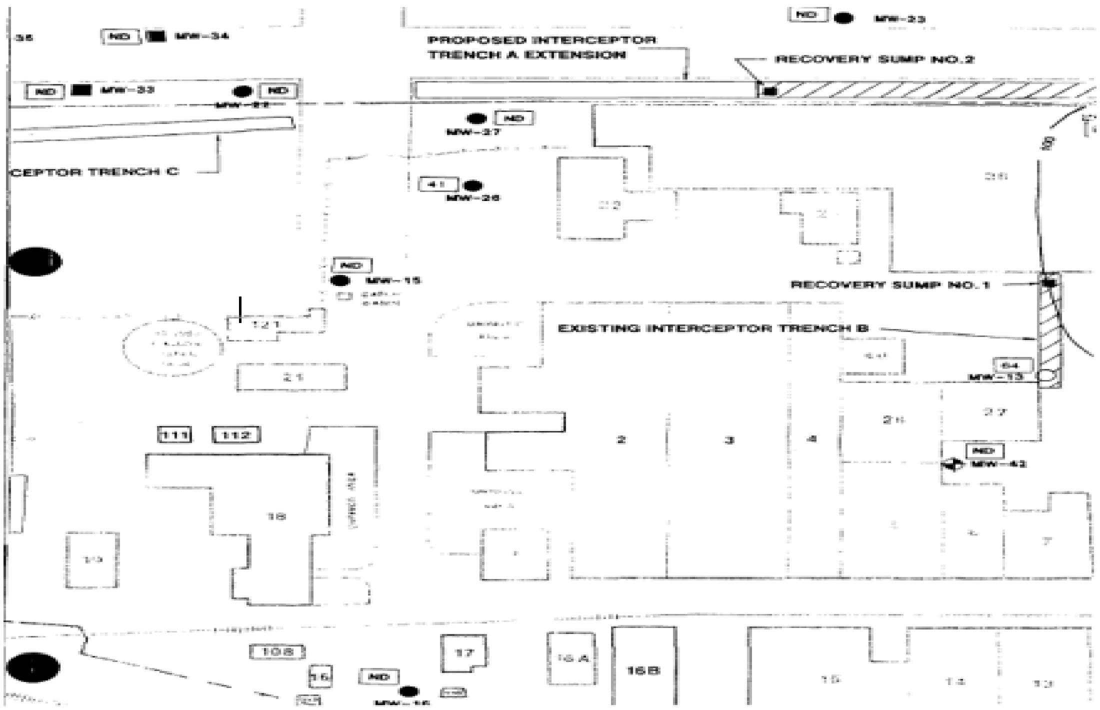
- PCBs (used and detected)
- PAHs (detected)
- DDx (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

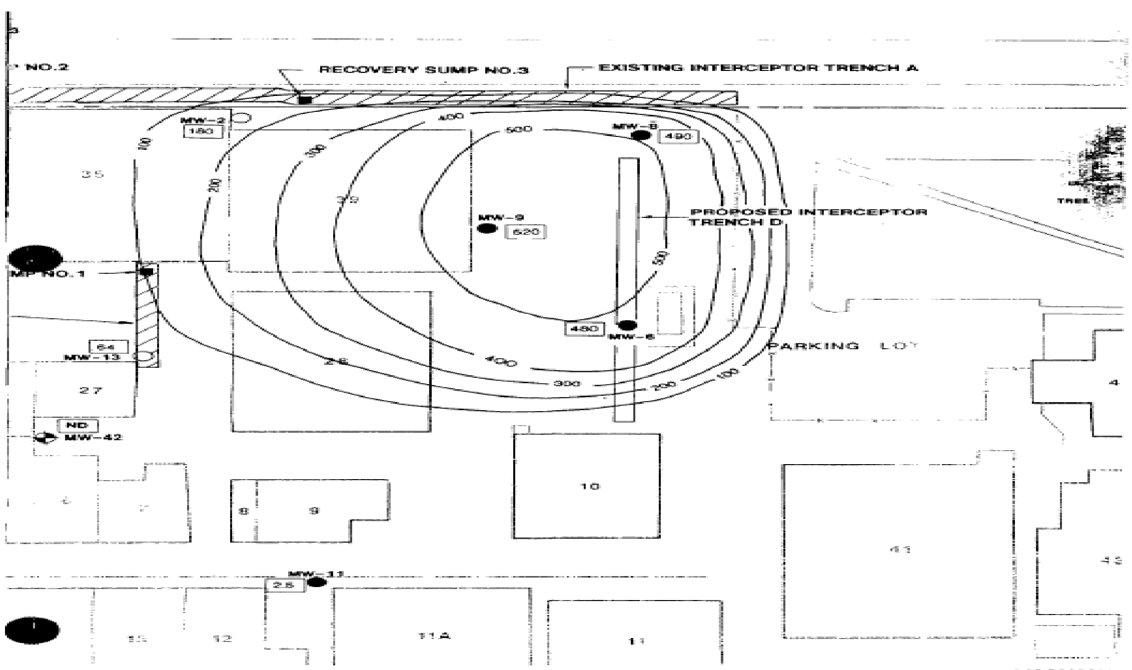
According to an NJDEP Letter, dated November 9, 1990, to Howard B. Epstein, Penick Corporation, 148 ppm PCBs were detected in sample OPA-30 collected from the South Drainage Ditch (PAS-00112953).

Results of the *1991 Supplemental Soil Characterization Program* noted that there were 620 ppb PCBs near sample OPA-43 along the southeastern border in 1987, but were not detected in five soil samples collected near the same location in 1991 (PAS-00113284).

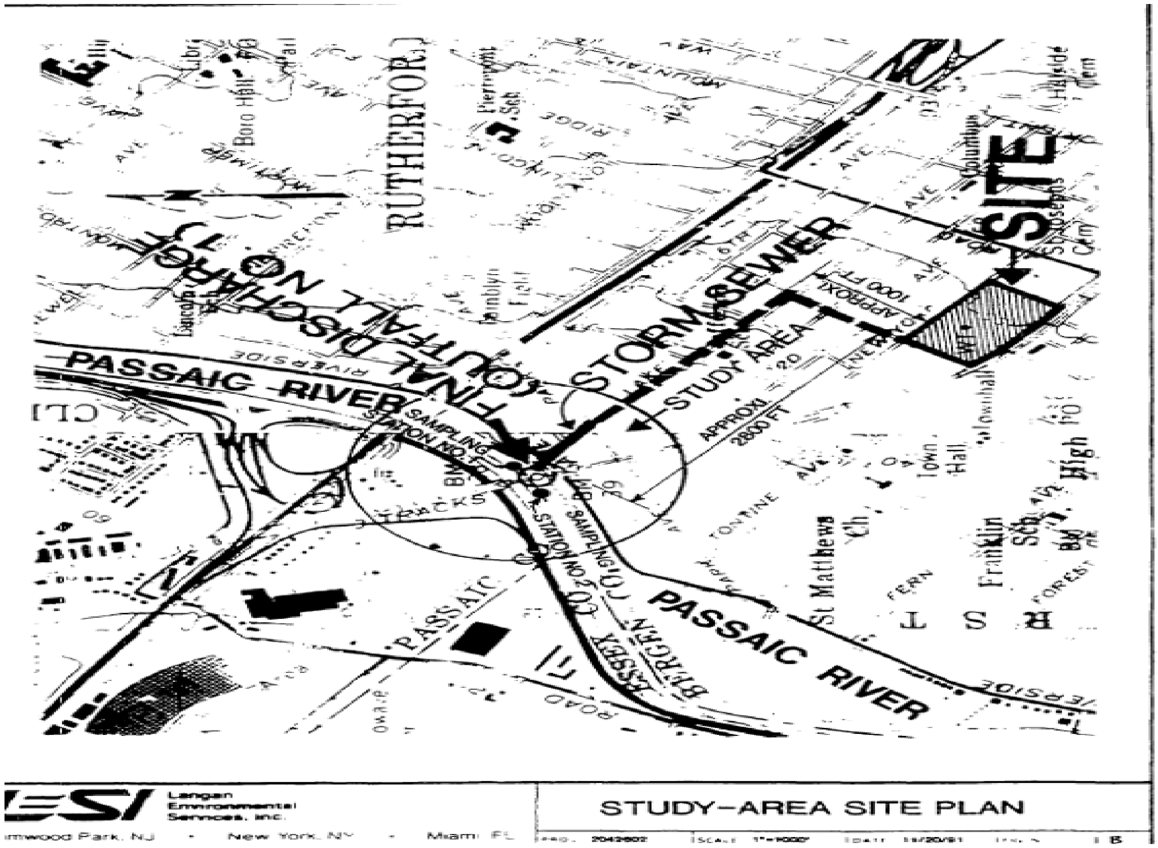
According to the 1995 RAR South Drainage Ditch, samples collected by Langan on April 19, 1995, identified 21 ppm PCBs in soil sample No. D-1 collected at 2 feet bgs (PAS-00113246).



(PAS-00113063)



(PAS-00113065)



(PAS-00113020)

According to a February 1985 letter from Penick to NJDEP, in July 1982, the one transformer that contained PCB oil was retrofitted with non-PCB oil. The transformers were noted to be on paved portions of the site (PAP-00328039-40).

According to the June 8, 2018, Deed Notice Restricted Area Data Table, a maximum concentration of 0.62 mg/kg PCBs has been detected at the facility from 0-2 ft. bgs (PAP-00328266; PAP-00328282).

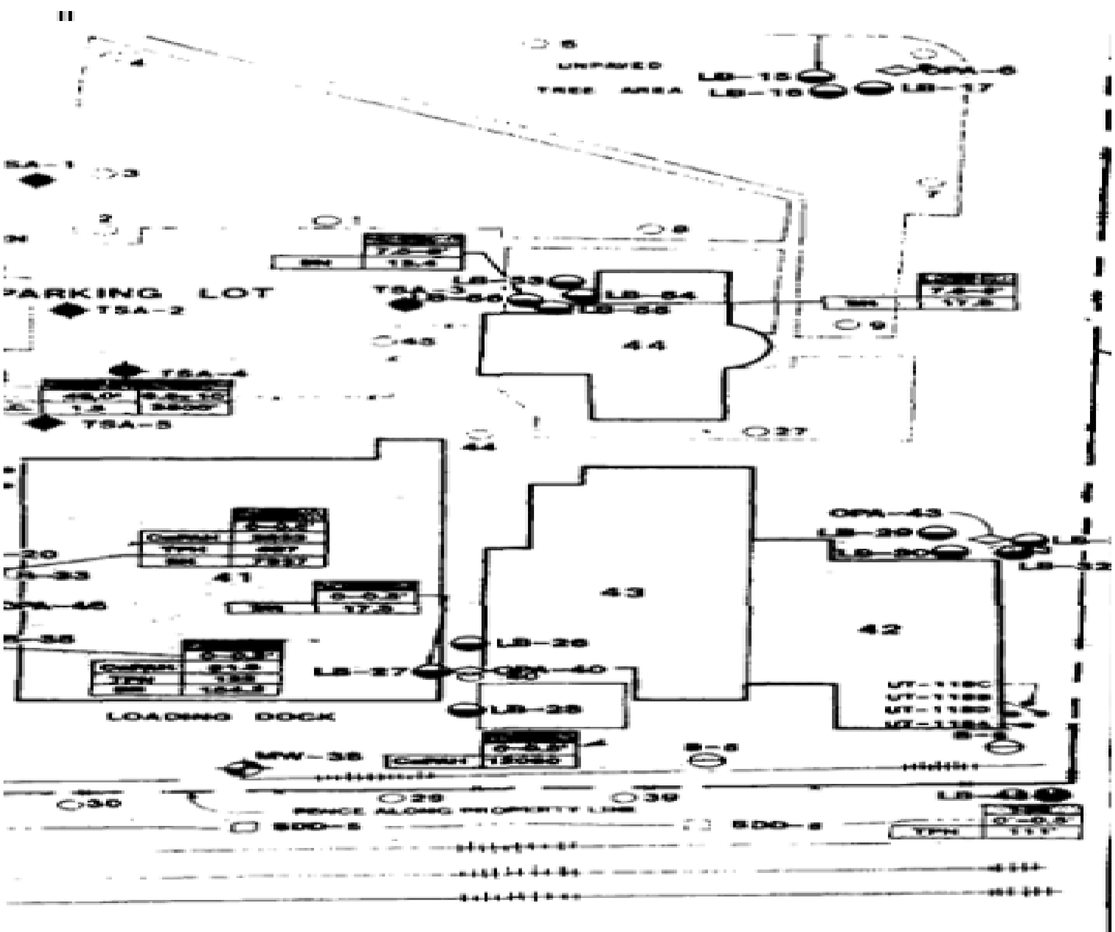
PAHs

Preparation of the 1985 EA by Versar, Inc. for the Penick Corporation involved collecting samples in July 1984 that detected ubiquitous PAHs at the site (PAS-00113117). The source of PAHs was believed to be asphalt particles; therefore, PAH sampling was dropped (PAS-00113121).

The *Results of the Supplemental Soil Characterization Program, Former Penick Corporation* developed by Langan Environmental Services (Langan) on May 14, 1991 (PAS-00113276) noted 67 ppm carcinogenic PAHs in sample “Other Plant Areas” (PAS-00113279) (OPA-6) collected in 1987 (PAS-00113283). Resampling of OPA-46 on January 10, 1991, identified 1,200,000 ppb fluoranthene and phenanthrene in soil

surface sample LB-33 located on the west central border. Soil sample LB-33 also contained 840,000 ppb benzo(a)anthrene; 940,000 ppb pyrene; and 2,833,000 ppb total targeted carcinogenic PAHs (CaPAHS). There were numerous other PAHs in surface soil sample LB-35, collected from the southeast corner of the facility which contained 22,000 ppb of chrysene and phenanthrene that are above the NJDEP action level of 10,000 ppb for base neutrals (PAS-00113306). PAHs exceeded NJDEP action levels in samples collected near OPA-53. Soil confirmation sample LB-38 collected on January 14, 1991, from the southwest corner of the facility, contained 180,000 ppb pyrene; 150,000 ppb chrysene and 130,000 ppb benzo(a)fluoranthene (PAS-00113307).

Analysis of the Septic and Leach Tank in Building 1 detected 13,000 ppb C12H15 PAH between 7.5 and 8 feet bgs in soil sample LB-59 near the center of the site (PAS-00113312). Background samples contained up to 5,300 ppb fluoranthene; 7,900 ppb pyrene in surface soil sample LB-41; 9,500 ppb benzo(b)fluoranthene and 7,600 ppb fluoranthene in surface soil sample LB-42; 347 ppm copper in surface soil sample LB-67 (PAS-00113316).



(PAS-00113321)

Conopco, Inc.

Diamond Alkali OU2 Allocation
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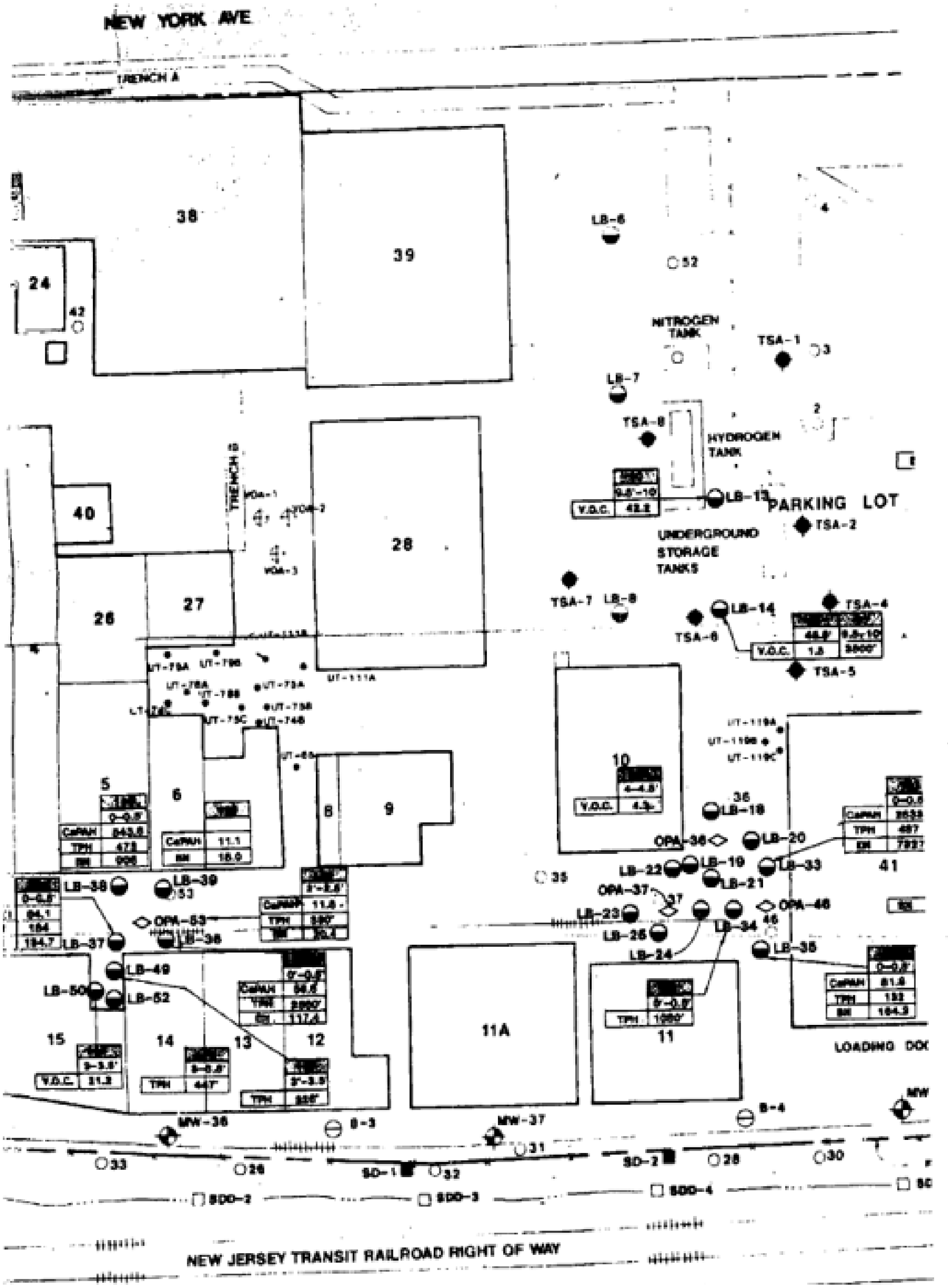
Facility Data Report



(PAS-00113323)

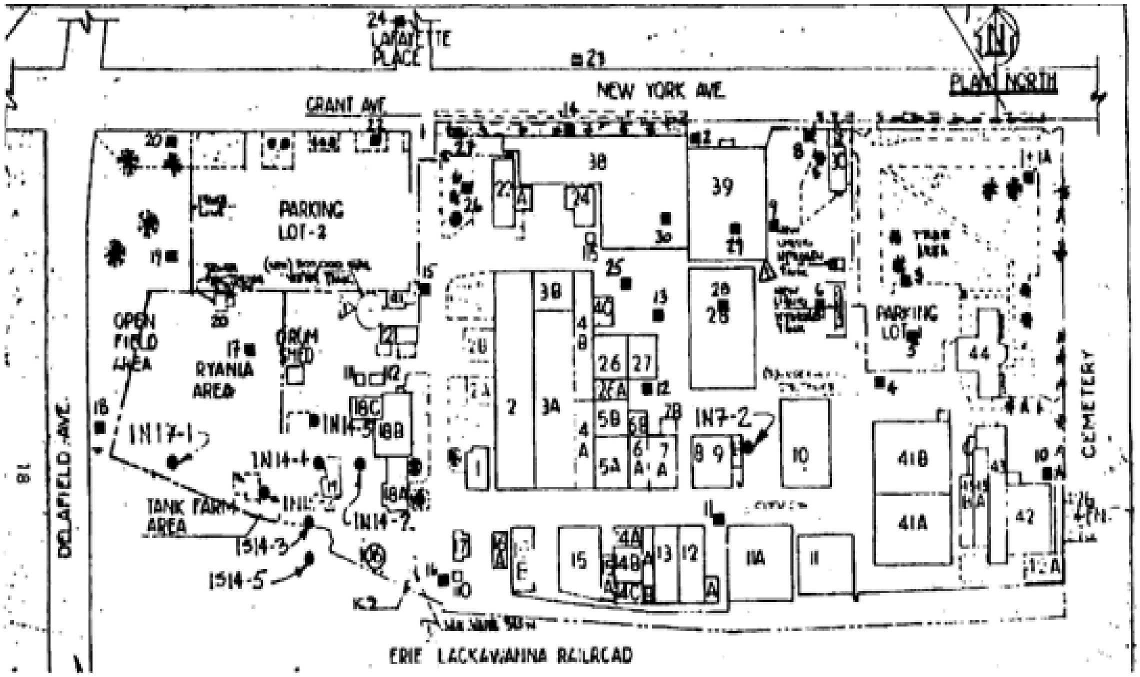
According to a *Remedial Action Report (RAR), South Drainage Ditch, Former Penick Corporation Site*, prepared for CPC International, Inc. by Langan dated December 8, 1995, sampling on April 19, 1995, identified PAHs that included 4.0 ppm benzo(a)anthracene; 3.8 ppm 3,4-benzofluoranthene and 2.5 ppm benzo(a)pyrene in soil sample D-1 collected at 2 feet bgs (PAS-00113246). South Drainage Ditch is located not far off-site (PAS-00113260). This ditch also receives runoff from other properties south of the Penick Facility, including south of the Penick facility, including a parking lot for some condominiums (formerly a paint factory) and a shopping mall (PAP-00327509).

DDx

Versar collected samples for the 1985 Penick EA in July 1984 and found between 660 mg/kg 4,4'-DDD in surface soil sample INI4-4 and 2 mg/kg in soil sample INI4-4 collected at 3 feet below ground surface (bgs) and between 370 mg/kg 4,4'-DDT in surface soil sample INI4-4 and 1 mg/kg in soil sample INI4-2 collected at 3 feet bgs near the southwestern corner of the site (PAS-00113127).

A July 2, 1990, *Cleanup Plan, Former Penick Corporation Facility*, prepared for CPC International by Langan, stated that four surface soil samples FB-1 through FB-4 were collected from the Foam Basin, approximately ten feet northwest of the on-site wastewater treatment plant on April 15, 1987, and September 2, 1987. The Foam Basin was a concrete floored, masonry walled basin used to trap foam originating from the sewer lines and neutralization tanks on the property. Soil sample FB-2 was collected from inside the Foam Basin, and the remainder were collected from outside the Foam Basin (PAS-00113339). Soil sample FB-2 contained concentrations of DDT, DDE and DDD at 600, 14 and 210 ppm, respectively. FB-3 contained 283 ppm DDD and FB-4 contained 28.8 ppm DDT (PAS-00113340). 4,4-DDT and 4,4-DDD were identified in soil sample UT-65 near UST No. 65 at concentrations of 9,700 and 10,200 ppm, respectively (PAS-00113349).

The report *Sampling Plan Results, Penick Corporation*, dated November 13, 1997, by Dames and Moore (PAS-00113205) showed 120,000 µg/kg 4,4-DDT, 2,900 µg/kg 4,4-DDE and 21,000 µg/kg 4,4-DDD in soil sample UT-116B associated with UST No. 116 (PAS-00113221-22).



(PAS-00113124)

According to a Regulatory Compliance Status document, in 1984 Penick completed cleanup of chlordane, DDT, DDE and DDD from Buildings 6 and 7 (PAS-00112928). A Deed Notice dated June 8, 2018, restricting use of the property states that DDD, DDT and DDE contamination remains at the facility and that the maximum concentration of each is 5.1 mg/kg, 13 mg/kg, and 3.6 mg/kg, respectively (PAP-00328266; PAP-00328282).

Copper

The July 2, 1990, *Cleanup Plan* prepared by Langan noted that 202 ppm copper was identified in surface soil sample TSA-5 collected on April 15, 1987 (PAS-00113344, PAS-00113339). Copper concentrations ranging between 189 and 3,930 ppm were identified in soil locations OPA-10, 13, 26, 28, 29 and 33 (PAS-00113345). Samples collected on April 1, 1995, for the *1995 RAR*, South Drainage Ditch, contained 587 ppm copper in soil sample D-1 collected at 2 feet bgs (PAS-00113246-47).

Lead

Soil samples collected on April 15, 1987, for the July 2, 1990, *Cleanup Plan* identified 1,090 ppm of lead in OPA-29 (PAS-00113345).

Samples collected on April 19, 1995, for the *1995 RAR, South Drainage Ditch*, contained 363 ppm lead in soil sample D-1 collected at 2 feet bgs (PAS-00113246-47)
A composite sample of sludge from the 1990s was sampled and the only Passaic COC detected in the sludge was lead, at 7.30 mg/kg (PAS-00112942).

Mercury

The report *Sampling Plan Results, Penick Corporation*, dated November 13, 1987, by Dames and Moore found 25,000 µg/kg mercury in soil sample UT-116B and 31,000 µg/kg mercury in soil sample UT-116C. Samples were associated with UST No. 116 (PAS-00113221).

The first round of sampling for the July 2, 1990, Cleanup Plan occurred between April 20 and 27, 1987; however, holding times were exceeded in some samples and a second round of sampling occurred between August 26 and September 2, 1987 (PAS-00113344). Sample analysis identified mercury concentrations that ranged between 1.0 and 7.6 ppm at sampling locations OPA-16, 17, 21, 24, 26, 37, 47 and 52 (PAS-00113345). The *Results of the Supplemental Soil Characterization Program, Former Penick Corporation Facility, ECRA Case No. 84090*, prepared for CPC International, Inc. by Langan dated May 14, 1991 (PAS-00113276), noted that 20 ppm mercury was found in 1987 sample OPA-37, but mercury was not found in five soil samples collected in 1991 in the vicinity of OPA-37 (PAS-00113284). In 1987, 16 ppm mercury was detected in OPA-43; however, no mercury was detected in 1991 in this area (PAS-00113284). A 1991 soil characterization effort collected eight soil samples from background areas adjacent to the facility, including from a New Jersey Transit right-of-way adjacent to the facility and a paint facility nearby (PAS-00113288-89). Mercury and copper were both detected at levels exceeding action levels at the former paint processing plant and the right-of-way. The same report concluded that, based on the "higher off-site levels of mercury," the "surficial mercury contamination found intermittently throughout the [Facility] is from a regional source and not from former site operations" (PAS-00113289-90).

According to a March 3, 1992, letter from Langan to NJDEP, Bureau of Industrial Discharge Permits, June 1987 water quality analysis identified 0.37 ppb mercury in MW-13 in the central portion of the site (PAS-00113045, 48). Samples collected on April 1, 1995, for the RAR, South Drainage Ditch, which is located not far off-site, contained 1 ppm mercury in soil sample D-1 collected at 2 feet bgs (PAS-00113244, 246-47,260).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[4]

Deed Notices dated June 8, 2018, states that historic fill at the facility contained PAHs, pesticides, PCBs and metals (PAP-00328266, 282; PAP-00328297, 312).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and

[4]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).

mercury.[5] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[6] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[7]

The levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00328282).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,090 mg/kg
Copper	3,930 mg/kg
Mercury	31 mg/kg
Benzo(a)anthracene	120 mg/kg
Benzo(a)pyrene	100 mg/kg
Benzo(b)fluoranthene	130 mg/kg
Benzo(k)fluoranthene	19 mg/kg
Indeno(1,2,3-cd)pyrene	38 mg/kg
PCBs	148 mg/kg

No information is available regarding when fill materials were placed on the facility site.

There is no indication from a review of provided documents that facility operations disturbed contamination located in historic fill.

5. COC Pathways

Storm Sewer

Possibly as early as 1947 chemical waste found its way from S.B. Penick & Company on Grant Avenue through an open channel into a storm ditch and into the Passaic River, according to PVSC (PAS-00112813). Between 1947 and 1984, a handful of spills were reported to reach the sewer system from the property, including an acetaminophen spill and a toluene spill reported in the 1984 *Potential Hazardous Waste Preliminary Assessment for the Penick Corp, 540 New York Avenue* (PAS-00112984-985).

[5] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[6] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[7] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a memorandum, regarding an Interim Inspection dated July 1994, all storm water from this site, including the off-site south drainage ditch, flowed to a sewer monitoring station. At this station, a pumping system rerouted the water via an above-ground pipe to a sanitary sewer catch basin near the facility's waste water system to which it was connected. The wastewater was then discharged to the sanitary POTW line. During periods when the capacity of the pump at the monitoring station was exceeded, the excess flow discharged directly to the storm sewer system. According to Mr. Sanchez, of Penco of Lyndhurst, the reason for the pumping of storm water from the site to the sanitary system was "just in case any sanitary lines may still be connected to storm sewer lines." Prior to the 1970's sanitary sewer lines were interconnected with storm sewer lines. To his knowledge, however, all sanitary sewer lines had been disconnected from the storm sewers in the 1970s (PAP-00327204).

A September 19, 1990, *Tentative Cleanup Plan for South Drainage Ditch* developed by various regulatory agencies described the drainage trench located along the railroad tracks on the south end of Penco property. The trench was on railroad property, but Penco discharged storm water into the trench. The effluent from the trench then flowed through plant storm sewers to a transfer pit at the northwest section of the plant. The transfer pit would divert via a transfer pump up to 15 gallons/minute of the storm flow into the PVSC industrial sewer line. The flow was neither treated nor sampled for contaminants. The remaining flow was then sent into the Passaic River via the town storm sewers. The effluent entering into the transfer pit averaged between 2 and 3 gallons/minute. Heavy rains exceeded that rate (PAS-00113375). A historical description noted that the drainage ditch had been in existence at least half a century, with the current (i.e., circa 1990) storm water discharges from the plant site discharging into it. In the 1970s, the plant obtained an NJDEPS permit for discharge of storm water into the trench, which was later terminated favoring discharge into the PVSC system (PAS-00113376).

An October 23, 1990, *Progress Report on Cleanup of South Drainage Trench* found three storm drains discharged into the drainage trench. One storm drain was a roof drain on Building 16 that was plugged. The other two storm drains located near Buildings 43 and 11 were set up to reroute the plant industrial sewer (PAS-00113370). At the time, the untreated storm flow including the trench outflow discharged into the town storm sewers. On September 28, 1990, a two-inch PVC pipe connected the storm sewer transfer pit bypass pump into the plant pretreatment station. Oil was skimmed and pH was adjusted. During large rainstorms the storm sewer bypass pump was inadequate to keep untreated storm water from passing directly into the town sewer system (PAS-00113371).

According to the 1985 EA, process wastewater from all buildings discharged to sewer lines connected to the industrial waste treatment plant where all of it was skimmed for oil and grease and neutralized with lime. The treated water was then discharged to the sewer line and then to the local publicly owned treatment works in Newark. Treated water left the plant property near the northwest corner, and the sewer was routed under the center of New York Avenue toward the Passaic (PAS-00113112).

The 1990 Progress Report also noted a steam condensate line from Building 41 that connected into the storm sewer (corrected on October 14, 1990); a floor drain in Building 43, that was not being used at the time, also connected into the storm sewer; and the west end cooling tower overflow connected at another point into the plant storm sewer system. The last two items were to be plugged off and redirected into the industrial sewer during the week of October 22, 1990 (PAS-00113372).

Sanitary Sewers

A letter NJDEP wrote to Howard Epstein, dated November 9, 1990, referred to a 1970 map that showed that the plant sanitary system consisted of a network of underground clay tile piping. NJDEP strongly recommended that the Penick Corporation identify points of exfiltration and fix them (PAS-00112956).

Sanitary sewers and the waste water pre-treatment system discharged to the sanitary sewer system of the Passaic Valley Sewage Commission (PAS-00112926, 72).

According to a July 31, 1995, Compliance Evaluation Inspection, contaminated groundwater was discharged to PVSC at 100 gpm while the CPC discharge permit for the Penco Lyndhurst facility was being negotiated and modified (PAS-00113078).

According to an August and September 1976 PVSC Monthly Report, on February 19, 1976, the S.B. Penick plant at 540 New York Avenue, Lyndhurst, connects to the New York Avenue storm sewer, thence to the Lake Avenue storm sewer to the Passaic River (PAS-00112806).

6. Regulatory History/Enforcement Actions

Permits

According to the April 30, 1984, *Initial ECRA Notice of Requirements*, S.B. Penick and Co. applied for a NPDES Permit on April 12, 1974, and the NPDES Permit No. NJ00D3531 was obtained on June 28, 1974. The permit covered discharge of storm water runoff to the Passaic River. Available references did not include the permit and associated flow and monitoring requirements. On April 4, 1977, EPA exempted S. B. Penick's Lyndhurst facility and canceled the permit (PAS-00113146; PAP-00048997).

According to PVSC Monthly Reports from August and September 1976, S.B. Penick & Company held NPDES Permit NJ0003531 (PAS-00112805-06).

According to the July 1991 response to an Administrative Order, the Penick Corporation applied for a RCRA Part A permit on November 14, 1980, to allow the plant to continue to operate as an interim status treatment, storage and disposal facility under RCRA (PAS-00113404).

The preponderance of hazardous wastes were placed in drums and temporarily stored in compliance with RCRA Part 262 generator standards prior to pick up by an outside contractor for off-site disposal. In November 1980, Penick Corporation completed a Part A permit application for RCRA interim status for continued operation as a treatment, storage and disposal (TSD) site. Four facilities were listed: the drum storage area, storage tank, an incinerator and a wastewater treatment tank system. The incinerator and treatment system were removed, as they did not qualify for RCRA regulation. The drum storage area operated under the storage permit standards for accumulation of wastes for up to 90 days, and a storage permit was not necessary; however, the underground flammable solvent storage operated under RCRA Part 265 rules (PAS-00112928-29).

According to the undated Regulatory Compliance Status, Penick Corporation obtained a permit, in compliance with Lyndhurst Ordinance No. 1744, on January 8, 1980, to manufacture, process, handle, use or storage significant quantities of hazardous chemical substances. The permit required an inventory of all hazardous chemicals and quantities in each plant area and compliance with leak-testing of underground storage tanks (PAS-00112929). None of the chemicals listed were OU2 COCs (PAS-00113154).

Penick had Sewer Connection Permit 18402412 to discharge process wastewater to the PVSC water pollution control plant in Newark for treatment. It expired January 26, 1986, (PAP-00328090; PAS-00112720).

According to a NJDEP letter, dated November 9, 1990, CPC International was notified that PVSC would not accept additional recovered water generated by a proposed trench expansion, and that it may require Treatment Works Approval (TWA) for a proposed groundwater treatment unit. If the discharge of treated, recovered groundwater will be to surface waters, the State required a NJPDES Discharge to Surface Water Permit. In addition, a NJPDES Discharge to Ground Water Permit would be required if treated groundwater would be discharged to the ground (PAS-00112957-58).

CPC held an Industrial/Commercial Surface Water Permit No. NJ0081248, effective February 1, 1995, through January 31, 2000, which permitted discharge of treated commercial/industrial water to the Passaic River via storm sewer at a rate of 30 gallons per minute through outfall Discharge Serial Number 001 (PAS-00113081, 83). NJDEP issued a Memorandum, dated December 15, 1999, that documented the facility associated with Permit No. NJ0081248 was demolished, the property sold, and the site redeveloped into a Shop Rite Supermarket. The permit for discharging to surface water was to be administratively expired upon CPC International, Inc. request (PAS-00113101).

The 540 New York Avenue address received NJPDES Permit NJ70013BO effective January 16, 1997, with an expiration date of January 15, 2002. This permit was issued to CPC International as permittee and Penco of Lyndhurst as co-permittee and property owner (PAP-00048752). The permit authorized the discharge of treated groundwater from an approved ground water remediation program back to the ground waters of the State via a Class V Underground Injection Control (UIC) well (PAP-00048757). Toluene was the only substance requiring monitoring (PAP-00048760).

NJPDES Permit No. NJ0081248, was effective from February 1, 1995, through January 31, 2000. The permit covered industrial and commercial surface water discharge from the 540 New York Avenue, Lyndhurst facility to the Passaic River via a storm sewer; however, the NJDPES permit was terminated as of December 17, 1999. A new Permit NJ7001380 was issued to modify discharge of treated water to groundwater (PAS-00113073-74).

Enforcement and Violations

A PVSC report, dated March 1947, attributed dark brown chemical waste from drug manufacture seeping from an open channel into a storm ditch that flowed into the Passaic River. The storm sewer was about a mile away from the plant. S.B. Penick & Company, Inc. planned to put in a permanent pipeline to avoid leakage through the open channel. The PVSC inspector had the leak stopped temporarily (PAS-00112810-11). A May 19, 1947, letter from PVSC again referred to S.B. Penick & Co., Inc. Drug Manufacturers on Grant Avenue, Lyndhurst that had industrial waste and sanitary sewage overflowing from a collection sump and an open storm ditch that discharged into the Passaic River. The river inspector found the pump in the sewage and waste collection sump in operational, and the plant engineer fixed the sump (PAS-00112813).

According to a PVSC Stream Contamination report for May and June 1948, on May 28, 1948, a PVSC inspector documented amber fluid (soap bark used in the manufacture of fire foam) from the S.B, Penick facility on Grant Avenue, Lyndhurst, discharging into a storm sewer that was attributed to a careless employee (PAS-00112815).

According to the PVSC Weekly Summary of Inspections by Inspector, on May 3, 1956, inspection of the Lyndhurst storm sewer showed a jet black discharge into the Passaic River that had killed a number of small fish. The inspector traced this flow to a sewer where the cover was lifted and saw it coming from the S.B Penick Co., 540 New York Ave facility. On May 4, the inspector revisited S.B. Penick and upon inspection of the sewer it was found to be clean and the violation had ceased, the source of the black discharge was unknown (PAS-00112818).

On May 17, the inspector observed a black discharge coming from the Lyndhurst Storm Sewer that was traced to the S.B. Penick Company where a blocked sewer was found to be the cause of the violation. Later that afternoon the storm sewer was inspected and found to be satisfactory (PAS-00112744).

According to a 1971 PVSC Annual Report, intermittently between November 1970 and September 1971, PVSC noted a discharge that went from S.B. Penick & Company, 540 New York Avenue through the Lake Avenue storm sewer to the Passaic River. On November 2, 1970, Mr. Lubetkin wrote to S.B. Penick & Company directing them to cease pollution, and they replied on November 5 that they were attempting to find the source. The problem appeared to be a carry-over from their barometric condensers on an intermittent basis. On March 17, S.B. Penick & Company experienced an industrial waste overflow into the Passaic River via the Lake Avenue storm sewer. Penick wrote to PVSC the next day explaining the situation had been corrected. PVSC again wrote to S.B. Penick & Company in April to let them know they were still polluting. After a plant inspection on May 25, S.B. Penick was told to find the source of small filamentous

particulate matter entering the storm sewer and find another path for the clean water overflowing into the railroad track ditch and then into storm sewers. S.B. Penick received another letter from PVSC on August 13 – all the while responding with letters letting PVSC know what they have been doing to track down the source. On September 2, S.B. Penick & Company was warned if the pollution was not terminated, the Commissioners would take legal actions. On October 1, S.B. Penick reported they had reconnected improperly connected lines, and the violation was considered eliminated (PAS-00034516; PAS-00034628-29).

According the 1974 PVSC Annual Report, between January and May 1974 PVSC reported solvent spills and boiler blowdown from the Penick facility that discharged into the Lake Avenue storm sewer and into the Passaic River (PAS-00112731-32;). CPC personnel informed PVSC that the spills were caused by a faulty vent and pump (PAS-00112722). According to the 1974 PVSC Annual Report, Reed Plumbing Company installed a continuous boiler blowdown system by May 24, 1974, that connected to the sanitary sewer (PAS-00112732).

According to a 1976 PVSC Annual Report, between February 19 and September 8, 1976, S.B. Penick was discharging a yellowish substance into the Lake Avenue storm sewer and into the Passaic River. A televised survey of the facility's storm sewer identified two leaks emanating from Building 41 that were sealed. Other leaks were found and grouted by the end of July. S.B. Penick, under control of CPC, addressed the issues and reduced the flow to the storm sewers to about 2,500 gallons per day. PVSC Inspector Laughlin felt that the balance of the flow was coming from the area adjacent to the Erie Lackawanna property. The Inspector considered the violation eliminated (PAS-00035289-90).

According to a PVSC Bi-Monthly Report, September and October 1977, S.B. Penick Company, 540 New York Avenue, had a Violation and Elimination for the period between February 2 and September 29, 1977. Facility discharge into the New York Avenue storm sewer was sampled on February 2 and February 8 and found to contain pollution that appeared to be acetaminophen. The source was a ditch along the Erie-Lackawanna Railroad right-of-way. The plan was to install a small pit to collect the material before pumping it into the sanitary sewer. In May, suppression of a fire on para-nitrophenol (PNP) pallets washed PNP into the storm sewer (PAS-00112802). After installation of the intercepting pit, there was still a slight flow of discharge into the storm sewer. After adjustments to the float collar on the pump start switch and the design of the intercepting pit, sampling in September confirmed the discharge was mitigated (PAS-00112803).

A PVSC Weekly Report for the week of February 3 through 10, 1978, noted on February 10th there was intermittent industrial pollution discharging into New York Avenue storm sewer from S.B. Penick Co., 540 New York Avenue (PAS-00112799).

According to a PVSC record, between July 7 and 13, 1978, a PVSC inspector found polluted wastewater discharging into the New York Avenue storm sewer from S.B. Penick Co., 540 New York Avenue. The plant manager informed the inspector that wastewater from floor washing was intended for the sanitary sewer, but went into the storm sewer due to a sump pump failure (PAS-00112793).

An October 23, 1990, *Progress Report on Cleanup of South Drainage Trench* referred to notices of violations Penco of Lyndhurst received concerning unpermitted discharges to the storm sewer and from the drainage ditch. The Progress Report also noted an incident where cleanup water from a reactor overflowed onto the roof of Building 41 and subsequently discharged into the facility's storm sewer (PAS-00113370, 372-73).

The property was deeded to the Penick Corporation by deed dated January 1, 1978, from CPC International, Inc., appearing on Book 6370 page 420 in the Deed of Books of Bergen County, New Jersey (PAS-00113366).

NJDEP issued a Declaration of Environmental Restriction in 1995 to Penco of Lyndhurst as a result of 4'4'-DDT, chlordane, heptachlor and other substances (PAS-00112717).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Preliminary Assessment, dated 1984 (PAS-00112981)
- Environmental Assessment of Contamination Associated with Penick Corporation, dated February 7,1985 (PAS-00113106)
- Supplemental Soil Characterization, dated May 14,1991 (PAS-00113276)
- Remedial Action Report – South Drainage Ditch, dated December 8,1995 (PAS-00113235)

Soil

In the 1991 *Results of Supplemental Soil Characterization* Langan collected 92 soil samples in an attempt to comprehensively define the lateral and vertical extent of contamination and scope of cleanup at the site (PAS-00113279-80). The characterization incorporated several septic tanks, leach pits, underground storage tanks and dry wells (PAS-00113280). Eleven background samples were collected – eight along transportation corridors to assess train and automobile exhaust influence on surficial soils and three from a former paint processing plant (PAS-00113288-89). Analytical results confirmed background carcinogenic PAHs were 19.2, 26.7 and 1 ppm in sample location LB-41, LB-42 and LB-43, respectively. Carcinogenic PAHs were 7.6 ppm alongside New York Avenue at sampling location LB-44 (PAS-00113289). Soil samples LB-67, LB-68 and LB 69, collected for background at an existing nearby shopping center that was the former paint processing plant. The highest concentrations of copper and mercury were found behind the former paint processing plant. Concentrations ranged between 188 and 525 ppm copper and between 0.35 and 136 ppm mercury. Action levels for copper and mercury are 170 ppm and 1 ppm, respectively. DDD, DDE and DDT were tentatively identified at 9.2 ppm, 2,3 ppm and 6.2 ppm, respectively in background concentration sample LB-41 (PAS-00113289).

Remedial Activities

The 1984 Preliminary Assessment (PA) for Lot 1, Block 79 of 540 New York Avenue for NJD 081 894 842 addressed fuel oil wastes, along with numerous other constituents (PAS-00112981; PAS-00112982; PAS-00112983). The PA addressed issues that included an acetaminophen spill, fugitive emission effects on the employee population, a toluene spill and the potable water supply (PAS-00112982-84).

Penick Corporation submitted remedial cleanup plans to NJDEP in 1984 (PAS-00112717).

The 1985 Environmental Assessment (EA) was produced for 540 New York Avenue facility as it became the subject of an agreement of sale and was created to establish viable remedial alternatives for cleanup. The tentative plans involved possible shutdown of some sections of the plant, but did not substantially alter the primary production of pharmaceuticals and pesticide chemicals (PAS-00113114). Many of the substances used on the property were botanicals for which there were few or no analytical techniques for soil or water; therefore, Versar used indicator parameters rather than those specific compounds. The indicator parameters were the 129 priority pollutants that EPA set for ambient water quality criteria in the Clean Water Act with the addition of 30 more organic compounds. Sampling was conducted in July 1984. Sampling results showed ubiquitous PAHs and pesticides throughout the site (PAS-00113116-17).

The 1987 Annual Hazardous Waste Generator Report, filed March 16, 1988, documented in 1987 CPC International removed all hazardous materials and wastes at the Lyndhurst facility via appropriate manifests. Removal of wastes were consistent with RCRA closure operations in December 1985 documented in a June 15, 1984, RCRA Plan that was not filed with the state (PAS-00112922).

The 1987 Analysis of sampling performed on or about August 28 through September 3 showed PCBs, pesticides, metals and base/neutral extractable organics at concentrations that significantly exceeded NJDEP action levels (PAS-00113208). Note: sampling results Tables 7-18 with concentrations were missing from the report. According to the1990 Penick DEF, the Penick Corporation was granted approval to proceed with remedial activities in 1990 following submission of remedial cleanup plans to NJDEP in 1984. The site was given Industrial Site Recovery Act (ISRA) E93651. 31 underground storage tanks were removed with ISRA oversight, and NJDEP provided oversight of contaminated pesticide cleanup in Buildings 6 and 7 (PAS-00112717).

The 1990 Cleanup Plan outlined a program of remediation for the property formerly owned by Penick Corporation and included removal of contaminated soil, characterization of extent and degree of contamination, and removal of USTs (PAS-00113329). Langan proposed no further action in “several” areas with hazardous substances in excess of cleanup levels because remediation would destabilize nearby site structures. No further action was also proposed near USTs 74, 75, 78, 79 and 116 because soil contamination had not impacted groundwater, and the areas were covered by an asphalt pavement (PAS-00113330).

The Cleanup Plan described the drainage trench located along the railroad tracks on the south end of Penco property. The trench is on railroad property, but Penco discharged storm water into this trench (PAS-00113375). The Cleanup Plan involved: 1) removal of oil-like substance from surface water, 2) elimination of Penco's discharge into the trench, 3) elimination of untreated storm drain trench flow into the industrial sewer, 4) cleanup of the trench, and 5) rerouting trench effluent after cleanup (PAS-00113376-78).

A NJDEP letter, dated November 9, 1990, to Howard B. Epstein, Lord Day & Lord, Barrett Smith, Penick Corporation, approved CPC International, Inc.'s Cleanup Plan for 540 New York Avenue, Blocks 73 and 79; Lots 1,3 and 1,2. The letter noted that cleanup levels were 5 ppm PCBs; 1,000 ppm lead; 1 ppm mercury; 10 ppm total of DDT, DDD and DDE; and 10 ppm carcinogenic PAHs (PAS-00112950-51). No further action was approved for thirty underground storage tanks (PAS-00112952). CPC International was to delineate all contamination above NJDEP action levels and was mandated to cleanup all contamination in excess of cleanup levels. CPC International was to submit PCB samples (PAS-00112952-53). The letter noted that a total of 40 underground storage tanks existed at the facility (PAS-00112954). The letter referred to a letter dated April 28, 1970, that identified a septic system that served Building 44, a septic tank and leach tank for Building 1, a leaching tank south of Building 19 that connected to Building 18; and a drywell in the southwest corner of Building 16. NJDEP required sampling of all abandoned septic systems (PAS-00112956).

Based on analytical results, excavation was proposed at OPA-46, OPA-53 (PAS-00113291) the Leach Tank in Building No. 19 (PAS-00113293).

The 1991 Ground Water Monitoring Report, conducted groundwater sampling of 23 monitoring wells (PAS-00113253). Langan concluded that soil contamination had little impact on groundwater quality. Because much of the contaminated soil had been removed or was to soon be removed, contaminant concentrations in groundwater were expected to decrease (PAS-00113262).

The 1995 RAR documented the removal of carcinogenic PAHs from the South Drainage Ditch for off-site disposal and the installation of a storm water conveyance system. The drainage ditch was located immediately south of the former Penick Corporation on property owned by the State of New Jersey and is operated by New Jersey Transit (PAS-00113236). The South Drainage Ditch was sampled during production of the Dames and Moore 1987 Report Sampling Results. Sediment in the ditch was black stained; there was stressed vegetation; and sheens on the surface water in the ditch (PAS-00113237-38). Remedial actions between June and August 1991 involved excavating 1,000 cubic yards of contaminated soil from the southern-most railroad siding for off-site disposal, along with removal of 480 linear feet of pipe that serviced the site's sanitary system. Between April 1993 and June 1993, a Remedial Investigation of the South Drainage Ditch concluded that groundwater near the ditch had not migrated to other off-site areas (PAS-00113239). Between June and July 1993, 900 cubic yards of soil contaminated with carcinogenic PAHs were removed. The 1995 RAR described 90 percent of the site was covered with impervious surfaces, and 40 percent of that was buildings (PAS-00113240). At the date of this document, approximately 3,500 cubic yards of contaminated soil was excavated and removed from the site. Between April

and May 1995 the South Drainage Ditch remediation was complete with installation of a subsurface stormwater conveyance pipe (PAS-00113243, 245).

On April 12, 1995, CPC International, Inc., sought approval for a Declaration of Environmental Restrictions (DER) for ISRA Case No. 84090, Former Penick Corporation. The letter noted that Penco of Lyndhurst filed a motion in U.S. Bankruptcy Court (Case N. 91-21339 WFT), returnable May 1, 1995, compelling Penco to execute a DER (PAS-00113359-60). The DER applied to Block 79 Lots 1 and 2 and Block 73, Lots 1 and 3 on the Township of Lyndhurst tax map. The proposed DER stipulated an impermeable surface cover would be placed and maintained in the area subject to engineering controls (PAS-00113360-61).

The July 2, 1999, memorandum documented the excavation of 31 underground storage tanks, including USTs No. 66 and No. 111, and that the RCRA Closure Plan had been carried out (PAS-00112948).

According to the Regulatory Compliance Status, parameters of the wastewater discharge permit were occasionally exceeded; however, Penick Corporation corrected them in a timely manner (PAS-00112926). The plant operated an on-site pretreatment wastewater plant for process wastewater. Per the Compliance Status, on April 30, 1984, Penick Corporation sent an “initial notice” to NJDEP announcing its intention to sell the Lyndhurst plant and telling them they had fulfilled their ECRA requirements (PAS-00112927). Penick subsequently submitted its environmental evaluation, with monitoring by Versar Inc. that found with the exception of the toluene spill there were a few locations where soil was contaminated by pesticides, primarily DDT and chlordane at levels of potential concern. Penick requested that NJDEP approve a negative declaration. Consistent with RCRA Part 262 generator standards, the preponderance of hazardous wastes generated at the plant drummed and temporarily stored while awaiting outside contractor off-site disposal. In 1984, Penick completed cleanup of chlordane, DDT, DDE and DDD from Buildings 6 and 7 (PAS-00112928).

8. Summary of Asserted Defenses

Conopco asserts the following defenses:

- Permitted releases are exempt from the definition of “release” under CERCLA. 42 U.S.C. §9601(10)(H).
- With respect to PAHs, Conopco asserts the petroleum exclusion. 42 U.S.C. §9601(14).
- Conopco may not be responsible for the entire period of 1941 to 1986 due to corporate successor and related issues. Conopco, Inc. is the successor in interest to CPC which purchased the stock and assets of S.B. Penick & Co. (“S.B. Penick”) in 1967, including the Lyndhurst Facility. CPC continued as the surviving corporation with S.B. Penick operating the Facility as a division of CPC. On December 7, 1977, Penick Corporation (“Penick”) was established as a separate, wholly owned Delaware Corporation. Penick then operated the Lyndhurst Facility until 1986 when all assets were sold to a third-party (Penco of Lyndhurst, Inc., which is not related to or affiliated with either Penick or CPC). CPC later sold Penick to a third party in 1988. Conopco, Inc. (“Conopco”) is the successor in interest to CPC.

COOPER INDUSTRIES, LLC

Facility Name, Address and Size: Cooper Industries, LLC (Cooper), 7, 13 and 26 Bank Street, Newark, NJ. Records reflect that a business of 10 -12 Library Court was in use as of about 1873 and by at least 1877, the business address included 14 and 18 Library Court (PAP-00480574; PAP-00480579; PAP-00728760).

According to the May 22, 2020 Expert Report the property at 7 Bank Street (1848 – 1854) was quite small it was calculated to be no more than 750 square feet (< 0.02 acres) by scaling an 1868 Newark Atlas Map (PAP-00480542; PAP-00480559; PAP-00728750).

The property at 13 Banks Street (1854 – 1869) was also quite small and calculated to be no more than 3,850 square feet (0.09 acres) by scaling the 1868 Newark Atlas Map (PAP-00480542). The property reportedly had a three-story building fronting Bank Street (in which the Wiss family lived upstairs), with a two-story building in the rear with a 950 square ft footprint (PAP-00728756).

The 26 Bank Street (store and residence) and Library Court (factory) (1869 – 1887) occupied 7,900 square feet (0.18 acres), based on scaling an 1874 fire insurance map (PAP-00480547; PAP-00728759). There is no evidence of any production activities at 26 Bank Street (PAP-00728765). The plant behind 26 Bank St. consists of three brick buildings, one three stories high, with a basement, covering an area of 40x60 feet; one 25, 50 feet, also three stories high and a two-story building, 25x25 feet (PAP-00480559).

By the 1870's there were reportedly nine employees (PAP-00480640). The employee count reportedly increased over the course of the operations at 26 Bank Street and Library Court, with there being a reported 50 employees working at the location by 1887 (PAP-00480628; PAP-0072764-65).

(PAP-00480547; PAP-00728761 as modified by Expert Report)

Note: The dark vertical line in the larger of the Library Court buildings indicates the location of the boiler (PAP-00728761).

Facility Data Report

1. **Business Type:** Specifics unknown. Certain records contain references to the "cutlery manufacturing trade" (PAS-00027499).

2. **Time Period of Ownership/Operations**

Operator: 1848 – 1887 (PAS-00027500-02)

Cooper acquired certain assets of an entity known as J. Wiss & Sons Co. in 1976, which entity was not formed until 1900 (after operations at the Bank Street locations had ceased) (PAP-00049987; PAP-00331507).

Ownership and operation of other persons / entities during the relevant time period and during the period immediately following the end of the relevant time period is set forth below.

Jacob Wiss occupied these properties sequentially, with no apparent overlap (PAP-00480559; PAP-00728748).

According to an April 12, 1864 Indenture (deed), Jacob Wiss, as an individual, owned property at 26 Bank Street, and his business earlier occupied first 7 Bank Street and then 13 Bank Street (PAP-00332545; PAS-00027500). The entity J. Wiss & Sons Co. never owned property at 7, 13, or 26 Bank Street as it was not incorporated until May 1900. In 1888, he bequeathed property to his children (PAP-00332550-54), who, conveyed the 26 Bank Street property to Prudential Insurance Company of America by deed dated February 1, 1889 (PAS-00034509, 11; PAP-00480537-39).

1848: According to the book, "*A Story of Shears and Scissors*, J. Wiss & Sons Co., 1848-1948" Jacob Wiss started his business in 1848 at 7 Bank Street in Newark (PAS-00027500; PAP-00480559).

1854: According to the book, "*A Story of Shears and Scissors* J. Wiss & Sons Co., 1848-1948", Jacob Wiss moved to 13 Bank Street in 1854 (PAS-00027500; PAP-00480559).

1860s: According to an article "*WISS, The Edge of Excellence Since 1848*", by the time of the Civil War, the Wiss retail shop had been moved twice to larger quarters on Bank Street. The military looked to Wiss for scissors to cut surgical dressings and tailor's shears to cut uniforms (PAS-00027521-22).

1869: Business moves to 26 Bank St (PAP-00480559).

1872: The Boyd's New Jersey State Directory from 1872 listed J. Wiss at 26 Bank Street as a cutlery manufacturer (PAS-00027496).

1877: Factory address changed to 14, 18 Library Court (PAP-00480559).

1880: According to the book "*A Story of Shears and Scissors*", when Jacob Wiss died in 1880, his son Frederick Wiss took over the family business (PAS-00027500).

1881: Name in the Newark Directory is J. Wiss's Sons (PAP-00480581).

1882: Business name is now J. Wiss & Sons Co., all grinding and repairing done on the premises was dropped from Newark Directory ad (PAP-00480581).

1887: According to the book "*A Story of Shears and Scissors*" the sons of Jacob Wiss acquired a large tract of land facing Littleton Avenue "on the hill" in Newark, and built their factory to meet the production needs of business with a 150 men workforce (PAS-00027502; PAP-00480560). Any manufacturing operations by the Wiss family at the Library Court location behind Bank Street would have ended (PAP-00480560; PAP-00728762). The retail store remained at 26 Bank St (PAP-00480560).

1888: The real property at 26 Bank Street was conveyed to Jacob Wiss' heirs, Louis Wiss and Charlotte Wiss, in 1888 (PAP-00332548).

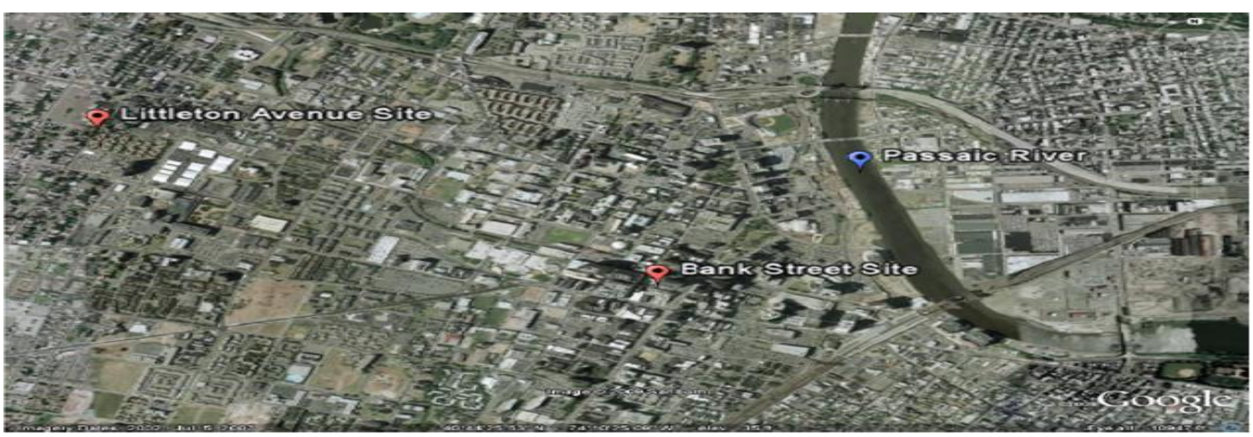
1889: Jacob Wiss' children conveyed the 26 Bank Street property to the Prudential Insurance Company of America by deed dated February 1, 1889 (PAP-00034511; PAP-00480537-39).

1900: J. Wiss & Sons Co. was incorporated (PAP-00331502).

1976: According to the Federal Trade Commission, Special Report of J. Wiss & Sons Co., J. Wiss & Sons Co., Cooper Industries, Inc. purchased "all the assets (except for certain assets relating to federal, state and local income taxes) presently comprising the business of, and presently owned by (unless otherwise noted) J. Wiss & Sons Co.". The Bank Street Property was not included (PAP-00331567-68).

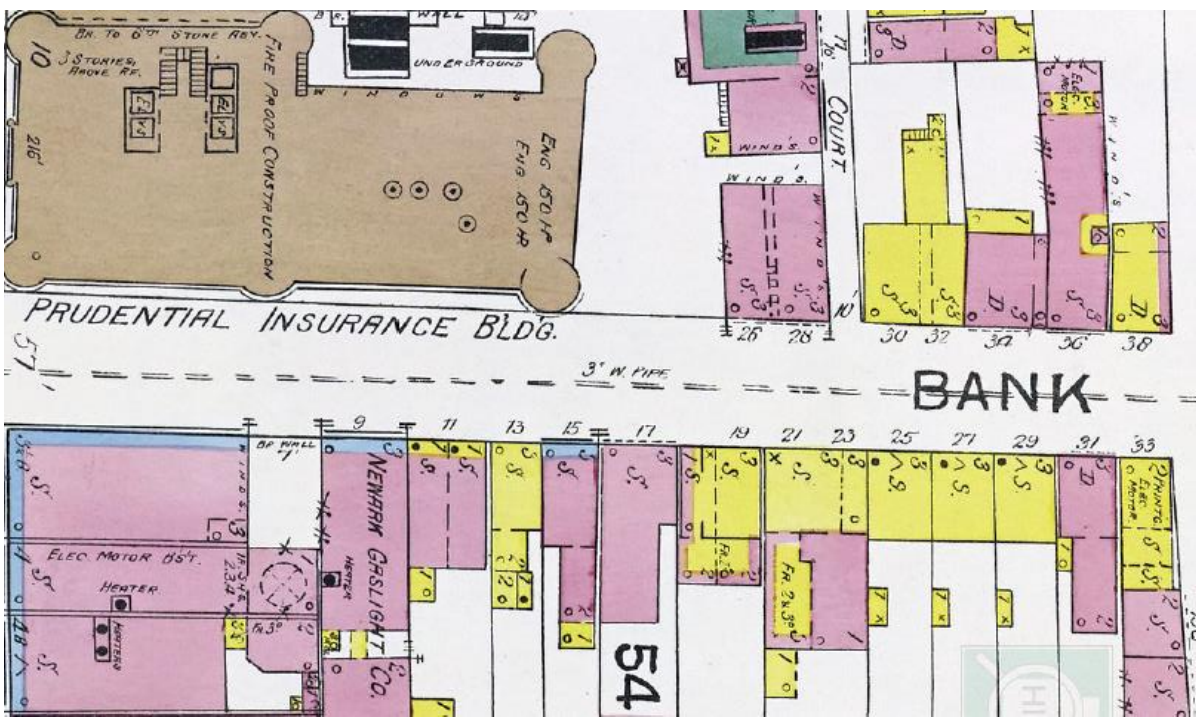
Note: The Banks Street locations relevant time period (1848 to 1887) ended 13 years before J. Wiss & Sons Co. was incorporated.

The following image from the 2009 DEF shows the location of the Bank Street site in relation to the Passaic River (PAS-00027478).



The following Sanborn maps from 1874 and 1892 show the location the Bank Street addresses:

(PAP-00332539)



1892 Sanborn Map of 7, 13, and 26 Bank Street (PAP-00332555)

3. Operational History/COC Use and Presence at the Facility

Specifics regarding the operations are limited, but the book "*A Story of Shears and Scissors"* states Jacob Wiss engaged in the cutlery manufacturing trade (PAS-00027499). Jacob Wiss manufactured shears and scissors using hand-operated drop hammers to weld cutlery steel blades and a dog-powered treadmill to power his grinding and polishing wheels until the late 1800's when dog-power switched to steam (PAS-00027499-500).

7 Bank Street (1848 – 1854)

Directory listings and advertisements from this period describe Mr. Wiss as a "cutler" and as of 1852 as a manufacturer of shears, scissors, razors etc. (PAP-00480563-4). Manufacturing at the 7 Bank Street property would have been done by hand, using hand-operated drop hammers to shape and weld steel blades to iron shear frames including four steps: forging / molding, tempering (heat treating), grinding and polishing (PAP-00480622; PAS-00027502; PAP-PAP-00728751).

The general methods of forging steel and iron in the cutlery business at the time were similar to those used in blacksmith shops and likely used a small coal forge of approximately one square foot. These forging operations would have included repeated heating, shaping, hammering and quenching bar stock iron or steel into the desired shape. After forging was completed the steel would be hardened through a process known as tempering, which includes a series of heating and cooling in a cold-water bath until the desired hardness of the steel was achieved (PAS-00027502; PAP-00728751-52).

After the metal was forged and tempered, grinding was performed using cylindrical stone grinding wheels and polishing using wooden wheels built up with a coating of beeswax, tallow, and emery on the polishing surface. At the start of operations in 1848, Wiss reportedly used dog-operated treadmills (one dog during the first year, with a second dog added during the second year) to power his grinding and polishing wheels. The first reference to mechanically powered operations by Jacob Wiss was a boiler used to steam power the grinding and polishing wheels (PAP-00480623; PAP-00480542; PAP-00728752).

Production volumes would have been very low. No information was found regarding the quantity of shears or scissors that could be produced in one day in these operations. The tempering, grinding, peening (a cold process of carefully forming steel with a hammer, usually a ball peen hammer) and polishing would have required the most time. Given the processes involved and that two different grades of steel likely had to be welded together (one used for the handle and the other used for the shear), it is estimated that one, or maybe two, pairs of shears or scissors could be produced by a person in one day and the pace of production would be dependent upon the size and the complexity of the design (PAP-00728752).

13 Bank Street (1854 – 1869)

Operations at 13 Bank Street would have been similar to those described above at 7 Bank Street, with manufacturing done by hand, using hand – operated drop hammers to shape and weld steel blades to iron shear frames, no plating process, and a "in the dry". No information was found regarding the quantity of shears or scissors that could have been produced, although production volumes would have been low due to the process described above (PAS-00027502; PAP-00480559; PAP-00728758).

26 Bank Street and Library Court (1869 – 1887)

According to the Expert Report, there is no evidence of any production activities at 26 Bank Street. Production took place at the Library Court locations in the rear at least as of early 1870s and until 1887, when the Littleton Avenue factory opened, and manufacturing operations were moved to and consolidated at that location (PAP-00728762).

At Library Court, some of the steps in the production process would have involved mechanically powered equipment, but at a relatively small scale. The first reference to mechanically powered operations by Jacob Wiss was circa 1870, involving a use of a boiler to power a 30 horsepower steam engine used to turn the grinding and polishing wheels (PAP-00480611; PAP-00480641; PAP-00728766).

The only raw materials used at the Library Court operations would have been steel and iron, and the small boiler was likely coal-fired. The production would have been a "dry" operation and therefore there would not be any wastewater discharges associated with the operations (PAP-00728768).

The 2009 DEF reported that there was no documentation available on the process of manufacturing plated products by J. Wiss & Sons, Co. prior to the 1950s; however, as early as the mid-1800s manufacturers produced commercial nickel-plated scissors (PAS-00027481, PAS-00027548, 550, 698). In addition, the 2009 DEF noted that nickel plating and steel pickling operations may have been conducted at the Bank Street site as early as 1850, based on general cutlery industrial practices at the time (PAS-00027483, 677, 709, 718). Note: There are no citations or available underlying documents to support these statements.

According to the 2009 DEF, between 1848 and 1985, J. Wiss & Sons forged, fabricated and finished steel at several locations in Newark, NJ, including the Bank Street locations in the mid-1800s (PAS-00027476, 478; 500, 502). According to *"A Story of Shears*", tailors' shears were still manufactured of malleable iron with welded crucible steel blades until as late as 1912 (PAS-00027504).

According to "*The Story of Wiss Quality"* the major steps in manufacturing scissors, shears and snips are die, and tool making, forging, grinding, heat treating, polishing and finishing (PAS-00027525, 479, 504).

According to an EPA publication, "*Profile of the Iron and Steel Industry*", dated September 1995, steelmaking in itself required a basic oxygen furnace into which molten iron, metal scrap, and high purity oxygen were heated. Fluxes and alloys were added, and may include fluorspar, dolomite, and alloying agents such as aluminum, manganese, and others. Outputs from the basic oxygen furnace include dust, sludge and metals-bearing waste (PAS-00027664). Note: The use of an oxygen furnace at the facility is unknown.

4. Identified COCs

Available references did not provide information regarding specific COCs used or discharged at the Bank Street locations during the time Jacob Wiss' and his family conducted operations there.

According to the Expert Report, the only COCs that are likely to have been stored and used at the Bank Street properties would have been trace levels of lead and copper in the purchased streel (assuming it would have been similar to later produced steel) and iron that would have been used to produce scissors and sheers (PAP-00728748, 58).

Historic Fill

The Allocation Team has determined that the Bank Street locations are not located on regional Historic Fill as designated by the NJDEP.[1]

5. COC Pathways

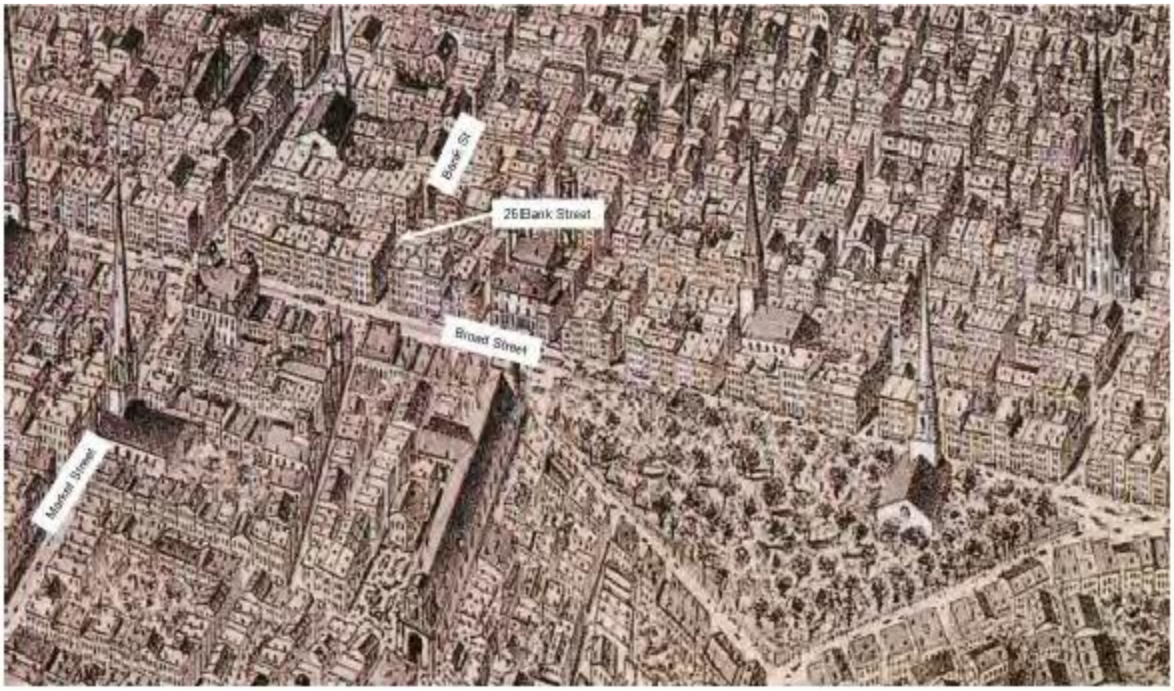
Limited information on pathways through which contaminants could be discharged to the Passaic River was available for the Bank Street locations.

Direct Discharge

According to the Expert Report, the Passaic River is located one-half mile from the Bank Street locations (PAP-00728748).

According to the Expert Report, during the relevant period, the Bank Street locations were located in an area near the center of Newark that contained residential, retail, commercial and small-scale manufacturing operations as shown in the 1874 "Birdseye" map of Newark (PAP-00728749). A portion showing Bank Street is below.

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 (NJDEP map identifying locations of recognized historic fill).



(PAP-00480545; PAP-00728749)

According to the Expert Report, there is no indication in maps from the era of any adjacent creek or other surface water body to any of the Bank Street locations (PAP-00728755).

Sewer

According to the 2009 DEF, prior to establishing the Passaic Valley Sewerage Commissioners (PVSC) system in 1924, sewers in Newark discharged untreated waste into the Passaic River. For its entire 40-year operating history, the Bank Street facility would have discharged process, sanitary, and storm water directly to the Passaic River via the Newark sewer system (PAS-00027483).

A sewer was not constructed in Bank Street until 1872, three years after Wiss moved to 26 Bank Street and Library Court (PAP-00480556; PAP-00728768). No records regarding the date on which 26 Bank Street property would have connected to that sewer have been identified (PAP-00728768). The sewer in Library Court was not installed until 1902, 15 years after Wiss' factory operations moved from the Bank Street area (PAP-00480558; PAP-00728768-69).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Available references did not provide information on response actions.

8. Summary of Asserted Defenses

Cooper asserts the following defenses:

- Cooper never owned or conducted any operations at any of the Bank Street locations. J. Wiss & Sons, Co. never operated at the Bank Street locations and was not formed until over ten years after the Bank Street real property was sold to Prudential Insurance Company (PAP-00332550; PAP-00331502).

- In the 1976 transaction wherein Cooper acquired certain assets of J. Wiss & Sons Co., Cooper did not assume any CERCLA liabilities of J. Wiss & Sons Co. or of any alleged predecessors to J. Wiss & Sons Co., including any such liabilities with respect to the Bank Street locations.

COOPER INDUSTRIES, LLC

Facility Name, Address and Size: Cooper Industries, LLC (Cooper); 75 Belmont Avenue, Belleville, New Jersey. The site consisted of approximately 15 acres combined (PAP-00334840; PAP-00335506).

Primary Battery Facility

The operations conducted at 75 Belmont Avenue have been referred to using a number of different names:

- A Site Survey, dated March 5, 1925, identified the facility as Thomas A. Edison, Inc., Edison Storage Battery CO, & Thomas A. Edison Silver Lake Plant in Bloomfield & Belleville NJ (PAP-00332567).

- In 1974 and 1977, a facility located on Belmont Avenue was identified by the New Jersey Industrial Registry as the Edison Battery Division of McGraw-Edison Co. (PAS-00027974, 76).

- In 1982 and 1989, a facility on Belmont Avenue was identified by the New Jersey Industrial Registry as the Power Systems Division of McGraw-Edison Co. (PAS-00027978, 80).

- According to a response to a Request for Information related to the Caldwell Trucking Superfund Site with respect to the Primary Battery Facility, the operations at the Primary Battery Facility have also been referred to as the Battery Products Plant of the Power Systems Group of McGraw-Edison (PAP-00334369).

- According to a response to a Request for Information with respect to the Primary Battery Facility related to the Caldwell Trucking Superfund Site, the operations at the Primary Battery Facility have also been referred to as the Edison Battery Products of Cooper Industries (PAP-00334369).

The Primary Battery Facility location is partially in the township of Bloomfield, New Jersey and partially in the township of Belleville, New Jersey (PAP-00333167). The location was also sometimes referred to as “Silver Lake” (PAP-00332567). The real property associated with the Primary Battery Facility consisted of approximately 5.6 acres (PAP-00335506).

Storage Battery Business

The operations conducted at the property adjacent to the Primary Battery Facility has been referred to using a number of different names:

- A memorandum notes the raw materials requirements of the Edison Chemical Works Division (PAP-00333465).

- A Map of Sewers and Water Lines labels the Storage Battery Business as the "Active Materials Department" (PAP-00333512).

The real property associated with the Storage Battery Business (defined below in Section 2) consisted of approximately 10 acres (PAP-00334840). The size of the Storage Battery Business' operations varied over time (see Section 3 below).

1. **Business Type:** The Primary Battery Facility manufactured wet and dry, primary batteries and charging equipment, such as chargers, converters, inverters, and voltage regulators, while the Storage Battery Business manufactured the active materials for storage batteries (PAP-00049802; PAP-00049213; PAP-00332578).

2. **Time Period of Ownership/Operations**

Primary Battery Facility

Owner: 1889-1992

Owner	From	To
Thomas A. Edison	1889	1910
Thomas A. Edison, Inc.	1910	1957
McGraw-Edison Company	1957	1985
Battery Products, Inc.	1985	1992

1926: Thomas Edison acquired the real property for the Primary Battery Facility through multiple conveyances, ultimately conveying the property to Thomas A. Edison, Inc. circa 1926 (PAP-00335517-30).

1957: Thomas A. Edison, Inc. was merged into McGraw-Edison Company (PAP-00194620). McGraw Electric Company is described as in 1957, having acquired the business, described as "owning and operating a manufacturing industry, producing and marketing a range of products, including…batteries", together with its related assets, for stock of McGraw Electric Company (PAP-00194620). According to the agreement between Thomas A. Edison, Inc. and McGraw Electric Company, McGraw Electric Company: (i) was assigned "all [Thomas A. Edison, Inc.'s] assets and properties"; (ii) assumed and discharged all "debts, liabilities and obligations" of Thomas A. Edison, Inc. as shown on the balance sheet or arising in the "ordinary course of its business prior to the date of closing"; and (iii) changed its name to "McGraw-Edison Company" (PAP-00194620-25).

1960: According to the McGraw Edison *1960 Report to Stockholders* and the Electric Storage Battery Company *72nd Annual Report, 1960*, the Electric Storage Battery Company acquired the storage battery facility from McGraw-Edison Company in 1960, while the primary battery facility remained with McGraw-Edison (PAP-00194648-49; PAP-00194661-63).

1985: In February 1985, Battery Products, Inc. Acquired the Primary Battery Facility from McGraw-Edison Company (PAP-00335534).

In March 1985, CI Acquisition Company was merged with and into McGraw Edison Company and McGraw-Edison Company became a subsidiary of Cooper Industries, Inc. (PAP-00194671).

1992: According to a letter from Christopher Marraro, Howrey LLP, dated June 30, 2010, Battery Products, Inc. sold the Belmont Avenue property to Dominick Tozzo by deed dated December 14, 1992 (PAS-00034505).

1995: Battery Products, Inc. was voluntarily dissolved on January 18, 1995 (PAP-00332556). According to the letter from EPA to Mr. Christopher Marraro, Esq., the McGraw-Edison Company merged with Cooper Industries, LLC in 2004. In the letter, EPA notified Cooper that the liabilities of the selling corporation became the liabilities of the surviving corporation, Cooper (PAS-00034499).

Operator: 1889-1987

Operator	From	To
Thomas A. Edison	1889	1910
Thomas A. Edison, Inc.	1910	1957
McGraw-Edison Company	1957	1985
Battery Products, Inc.	1985	1987

Based on the available references, the facility at 75 Belmont Avenue in Belleville, New Jersey originally operated as Edison Manufacturing Company, a battery manufacturer in the early 1900s (PAS-00027943, 48, 89; PAP-00194594, 97; PAP-00194750). There are conflicting references in available documentation as to when operations at the Primary Battery Facility actually began. A summary of those references is included below.

1889: Some sources reference operations of the Primary Battery facility as early as 1889 (PAP-00332563; PAP-00332593).

1909: According to the New Jersey (NJ) Industrial Registry, Edison Mfg. Co. manufactured primary batteries in Silver Lake in 1909. Note the Registry did not have similar listings for the years 1912, 1915, 1918, 1921, 1931, 1940-41 or 1943-44 (PAS-00027916-980).

1911: The Company was merged with Thomas A. Edison, Inc. (PAS-00027989). A site survey map from 1925 identified Thomas A. Edison, Inc. as operating the Primary Battery Division and Salvage Division, while Edison Storage Battery Co. operated the Chemical Works Division at the Silver Lake plant on Belmont Avenue (PAP-00332567).

According to the *Preliminary Assessment Report*, dated May 24, 2012, for the Pathmark Supermarket site, Thomas A. Edison Inc. took ownership of the Chemical Works facility in the mid-1920's (PAP-00334774, 87). By 1938, the entire site was identified as owned by Thomas A. Edison, Inc. (PAS-00027984; PAP-00334787).

According to the survey map of the Silver Lake Plant prepared by the Plan Department of the Associated Mutual Insurance Cos., the Primary Battery Division Buildings were built in about 1911-12 (PAP-00332567).

1914: According to Edition Primary Batteries – An Old Timer's Recollection, the Primary Battery manufacturing operations of Thomas A. Edison, Inc. were not moved to the Silver Lake until 1914 (PAP-00334576).

1930: According to a Selected Substance Report prepared by McGraw Edison Co. in 1981, the facility began operations in approximately 1930 (PAP-00334489).

1987: The facility ceased operations in 1987, when Cooper Industries moved the operations to South Carolina (PAP-00050209-10).

<u>Size and Operations over Time</u>

Based on the available references, the size and operations of the Primary Battery Facility varied over time. A summary of those references is included below.

1920: According to a May 1920 edition of "The Flash", a newsletter "issued for the employees of the Primary Battery Division of Thomas A. Edison, Inc., Bloomfield, New Jersey," production was down because it was difficult to get materials into the plant and to get workers to "do their part" in light of the ongoing railroad strike (PAP-00334659).

1925: A site survey, dated March 5, 1925, identified the Primary Battery Division of Thomas A. Edison, Inc. located at the Silver Lake plant as producing batteries (PAP-00332567).

1927: According to the Industrial Registry, 202 employees were employed at the Primary Battery Facility in 1927 (PAS-00027931).

1930s: According to "Edison Primary Batteries – An Old Timer's Recollection," by the mid-1930s, "factory working conditions were deplorable" at the Primary Battery Facility, and "it had become obvious that the business could not be continued without undertaking a major rebuilding" (PAP-00334605).

1936: According to corporate meeting minutes, the Primary Battery Facility was producing around 114,000 – 115,000 units per month in the fall of 1936 (PAP-0033288).

1938: According to the Industrial Registry, 343 employees worked at the Primary Battery Facility and the Storage Batter Business combined (PAS-00027952).

1940-1941: According to the Industrial Registry, 398 persons worked at the Primary Battery Facility and the Storage Battery Business combined (PAS-00027955).

1943-1944: According to the Industrial Registry, 398 persons worked at the Primary Battery and the Storage Battery Business combined (PAS-00027955).

1944: According to corporate meeting minutes, the Primary Battery Facility was having "an unusually difficult time getting materials" circa 1944 (PAP-00334721).

1947: A facility located on Belmont Avenue was identified by the New Jersey Industrial Registry as the Edison Battery Division of McGraw-Edison Co. (PAS-00027974, 76).

1956- 1959: According to the Industrial Registry, 163 persons worked at the Primary Battery (PAS-00027968, 70).

1963: According to handwritten notes by William R. Rawson, water consumption for the Primary Battery Facility was 1,178,500 cu ft. in 1963 (PAP-00333524).

1964: According to handwritten notes by William R. Rawson, water consumption for the Primary Battery Facility was 1,078,000 cu ft. in 1964 (PAP-00333524).

1965: According to handwritten notes by William R. Rawson, water consumption for the Primary Battery Facility was 1,227,500 cu ft. in 1965 (PAP-00333524).

1966: According to a letter from the Bloomfield Town Engineer, water consumption for the Primary Battery Facility was approximately 1,039,500 cu ft. in 1966 (PAP-0033509).

1967: According to the industrial Registry, 135 employees worked at the Primary Battery Facility (PAS-00027972).

1970's: The *Final Preliminary Assessment Final Remedial Investigation Report*, dated May 6, 2017 (Final RI Report), stated that the buildings associated with the Thomas A. Edison, Inc. Chemical Plant were demolished in the early 1970's, and the property remained vacant until it was redeveloped as a retail grocery store and laundromat with associated parking lots in 1980 (PAP-00334737, 840).

1974: According to the Industrial Registry, 250 persons worked at the Primary Battery Facility (PAS-00027974).

1976: According to a response to a CERCLA §104(e) request for information for another Superfund Site (CERCLA §104(e) Response), the Primary Battery Facility's production of the zinc, copper oxide primary batteries ended in 1976 (PAP-00334371).

1977: According to the Industrial Registry, 250 employees worked at the Primary Battery Facility (PAS-00027976).

1978: According to handwritten notes regarding operations of the Primary Battery Facility, 292,000 battery units were produced in 1978 (PAP-00334686).

1979: According to a PVSC Sewer Connection Application, the Primary Battery Facility employed 175 employees full-time, each working 5 days per week (PAP-00402959).

1981: According to a "Division Survey" conducted in 1981, the average employment for the Primary Battery Facility at that time was 175 (PAP-00334517).

1982: A facility on Belmont Avenue was identified by the New Jersey Industrial Registry as the Power Systems Division of McGraw-Edison Co. (PAS-00027978, 80). According to a response to a Request for Information related to the Caldwell Trucking Superfund Site with respect to the Primary Battery Facility, the operations at the Primary Battery Facility have also been referred to as the Battery Products Plant of the Power Systems Group of McGraw-Edison or as the Edison Battery Products of Cooper Industries (PAP-00334369).

1984: According to an NJDEP Investigative Report in 1984, approximately 100 people were employed by the Primary Battery Facility (PAP-00332930).

1985: In an application for a sewer connection permit submitted to PVSC, the Primary Battery Facility was reported to have 116 full-time employees, working 240 days per year with 3 shifts per day (PAP-00333483).

1986: According to a 1986 press release regarding the upcoming closure of the Primary Battery Facility, the General Manager said that the Primary Battery Facility had "been operating at about half its capacity and that antiquated facilities have made it uneconomical to operate in today's competitive marketplace" (PAP-00335444).

Storage Battery Business

Owner: Unknown – 1960 (PAP-00334750).

Owner	From	To
Thomas A. Edison	Unknown	1925
Thomas A. Edison, Inc.	1925	1957
McGraw-Edison Company	1957	1960
The Electric Storage Battery Company	1960	1967
S.W.M Realty Corporation	1967	1967
Seymour Heller and Nathan Pflasky	1967	1969
Alexander Caplan and Nathan Plafsky	1969	1969
Supermarkets General Corporation (SGC)	1969	1971
SGC / Public Service Electric and Gas Company	1971	1971
Jersey Stuart, Inc. / Public Service Electric and Gas Company	1971	2014
BOIV Belleville MCB, LLC	2014	Present

1957: As noted above for the Primary Battery Facility, in 1957 McGraw Electric Company acquired certain assets of Thomas A. Edison, Inc., including the assets and property associated with the Storage Battery Business.

1960: In 1960, the Electric Storage Battery Company acquired the Storage Battery Business from McGraw-Edison Company (PAP-00194648; PAP-00194661; PAP-00194663).

Operator: 1900 – 1960 (PAP-00334750)

Operator	From	To
Thomas A. Edison	1900	1925
Thomas A. Edison, Inc.	1925	1957
McGraw-Edison Company	1957	1960
The Electric Storage battery Company	1960	1969
None / Vacant	1969	1980
Pathmark Supermarket	1980	2015
None / Vacant	2015	2016
Super Fresh Food World	2016	Present

<u>Size and Operations over Time</u>

Based on the available references, the size and operations of the Storage Battery Business varied over time. A summary of those references is included below:

1900 – 1905**:** According to the survey map of the “Silver Lake Plant” prepared by the Plan Dep’t of the Associated Mutual Insurance Cos., the “Chemical Works Div. Bldgs Nos 7 to 28 inclusive [were] built in 1900-05” (PAP-00332567).

1901: A letter from Edison in 1901 instructs an employee to begin the placing and arranging of the Silver Lake Storage Battery Business (PAP-00334344).

1904 – 1909: The Storage Battery Business was closed down in December 1904 and production as suspended until 1909 for technical improvements (PAP-00335388; PAP-00194750).

1916: According to a June 5, 1916 Insurance Service Department Memo regarding the Settlement of Loss by Fire Edison Chemical Works, Silver Lake, a fire occurred in May of 1916, with losses to the building, equipment and stock of the Storage Battery Business valued at over $52,000 (PAP-00334421).

According to the survey map of the Silver Lake Plant prepared by the Plan Department of the Associated Mutual Insurance Co., the Chemical Works Division Buildings 111 – 129 were built in 1916 – 1917 (PAP-00332567).

1917: According to a memorandum for the Storage Battery Business, the Storage Battery Business employed 205 men in October 1917 (PAP-00332944).

1921: According to a handwritten note dated April 1921, the Storage Battery Business was not in operation at that time (PAP-00334422).

1925: According to a Questionnaire submitted to PVSC in 1925, the Storage Battery Business employed 91 persons (PAP-00333531).

1927: The first time the New Jersey Industrial Registry listed the Storage Battery Business as manufacturing storage battery material in Belleville, Bloomfield or Silver Lake was in 1927, but the Registry did not contain similar listings for storage battery manufacturing in Belleville, Bloomfield or Silver Lake for 1931 or 1956 – 1957 (PAS-00027916 – 80). The Industrial Registry reported 92 employees for Edison Storage Battery Co. in 1927 and listed it as manufacturing storage battery material (PAP-00027929).

1934: According to the Industrial Registry, 322 employees worked at Thomas A. Edison, Inc. batteries (PAS-00027940).

1936: According to the corporate meeting minutes of Thomas A. Edison Industries from September 1936, the Storage Battery Division started a program that eventually would bring most or all of their Silver Lake Operations to Orange (PAP-00332886).

1938: According to the Industrial Registry, 343 Employees worked at the Thomas A. Edison, Inc. (Primary Battery Facility and the Storage Battery Business combined) (PAS-00027943).

1940-1941: According to the Industrial Registry, 398 persons worked at the Primary Battery Facility and the Storage Battery Business combined (PAS-00027955).

1943-1944: According to the Industrial Registry, 398 persons worked at the Primary Battery and the Storage Battery Business combined (PAS-00027955).

1970: According to the 2017 Final RI Report, the buildings associated with the Storage Battery Business were demolished in the early 1970s and the property remained vacant until it was redeveloped as a retail grocery store and laundromat with associated parking lots in 1980 (PAP-00334840).

3. Operational History/COC Use and Presence at the Facility

Primary Battery Facility

Operations began at the Primary Battery facility as early as 1889, according to New Jersey Environmental Clean-up Responsibility Act (ECRA) and remedial reports (PAP-00332563; PAP-00332593). Based on Industrial Directories of New Jersey, the facility had been manufacturing batteries at the Belmont Avenue facility since at least 1909. The earliest entry in the available Industrial Directories was an Edison Manufacturing Company located in Silver Lake (now Belleville) that made primary batteries in 1909 (PAS-00027916-17). According to a Selected Substance Report prepared by McGraw

Edison Co. in 1981, the facility began operations in approximately 1930 (PAP-00334489).

A site survey, dated March 5, 1925, identified the Primary Battery Division of Thomas A. Edison, Inc. located at the Silver Lake plant as producing primary batteries, while the Chemical Works Division of Edison Storage Battery Co. produced nickel hydrate, nickel sulfate, medical iron, iron sulfate and oxide, and wax records. The Primary Battery Division buildings were listed as built in 1911 to 1912, and the oldest Chemical Works Division buildings were listed as constructed in 1900 to 1905 (PAP-00332567).

A December 23, 1981, Division Survey for the Power Systems Group located at 75 Belmont Avenue, stated manufacturing operations consisted of sheet metal fabrication of electronic hardware; machining battery parts and electronic hardware; painting electronic housings; assembling, packaging and shipping batteries and electronics; various mixing, baking casting and foundry operations (PAP-00049802).

According to Edison Primary Batteries – *An Old Timer's Recollection*, the Primary Battery Facility did not have any laboratory facilities or technical personnel. Instead, the Primary Battery Facility had to use laboratory space and equipment from the Storage Battery Business if such facilities were required (PAP-00334584).

According to a response to a Request for Information pertaining to the Primary Battery Facility, the Primary Battery Facility manufactured several different types of primary batteries: 1) a zinc, copper oxide primary battery (until 1976); 2) a zinc, carbon primary battery (from 1978 through 1986); 3) a nickel-cadmium, sintered plate battery (from 1975 through 1978); and 4) the Mercury Free Primary Battery (beginning in 1986) (PAP-00334371).

According to a December 11, 1990 Response to Information Request for Caldwell Trucking Superfund Site, the Battery Products plant up until 1976 manufactured zinc, copper oxide primary battery. The production process involved the recycling of returned batteries, which required the washing of copper oxide plates and then grinding them into powder; an amalgamation operation of zinc plates with mercury was also necessary. In the course of performing these operations, come heavy metals were introduced into the plant liquid effluent and settled out to be periodically pumped into the sludge holding area, and eventually disposed of off-site. The production of this type of batter was discontinued at the end of 1975 (PAP-00334371).

The *General Information Submission and Site Evaluation Submission (ECRA SES) for Battery Products, Inc.*, which was submitted to ECRA July 10, 1986, stated anodes, cathodes, and electrolytes were produced at the facility, as well as a lime refining operation. Mercury was used to produce a final anode mixture containing 0.25% mercury, and asphalt was used to seal the carbon black in the battery (PAP-00049213-14). According to handwritten notes regarding operations of the Primary Battery Facility in 1978, 292,000 battery units with four anodes each were produced in 1978, and each anode contained 3.965 grams of mercury(PAP-00334686).

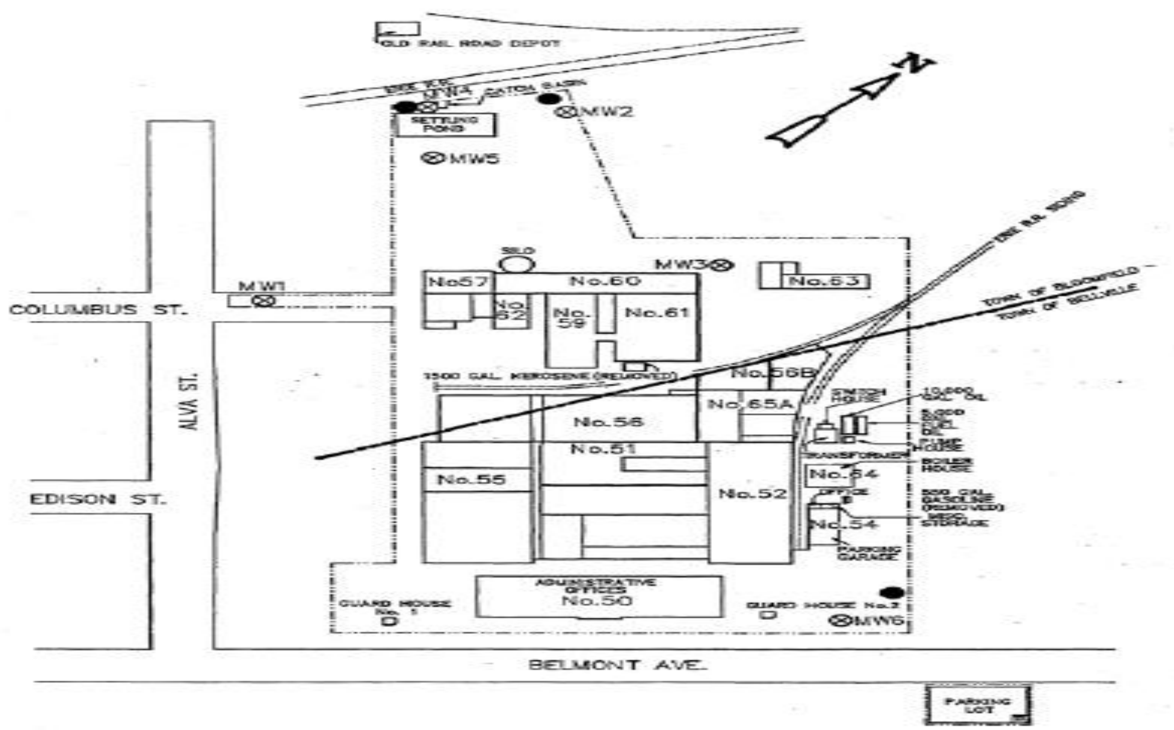
From 1975 through 1978, Battery Products operated a nickel-cadmium, sintered plate aircraft starting battery. Thereafter, from 1978 through 1986, Battery Products manufactured a zinc, carbon primary battery which required that the zinc anodes be amalgamated with mercury (PAP-00334371).

According to a response to a Request for Information pertaining to the Primary Battery Facility, the manufacturing of the nickel-cadmium, sintered plate battery involved nickel and cadmium process. From 1978 through 1986, Battery Products manufacture a zinc, carbon primary battery, which required that the zinc anodes be amalgamated with mercury. In September 1986, Battery Products changed over to the Mercury Free Primary Battery (PAP-00334371).

The 1986 ECRA SES identified storage facilities at the Primary Battery Facility, including a 1,500 gallon kerosene steel tank; 50 and 5,000 gallon potassium hydroxide steel drums/tanks; a 50-year old, 185,000 gallon, abandoned settling pit that contained sludge and rain water; a 50 pound steel drum containing bichloride of mercury; a (removed) 550 gallon steel tank containing gasoline; a 55 gallon steel drum containing methylene chloride; a 55 gallon steel drum containing phenolic mod polyester resin varnish; a 55 gallon steel drum containing denatured alcohol – ethanol; and a 15 gallon carboy containing hydrochloric acid (PAP-00049221).

According to the response to Question 12 of the 1986 ECRA SES (Inventory of Substances Contained Throughout Plant), mercuric chloride and mercury zinc were stored in the foundry (PAP-00334403, 08). No other COCs were listed in the inventory.

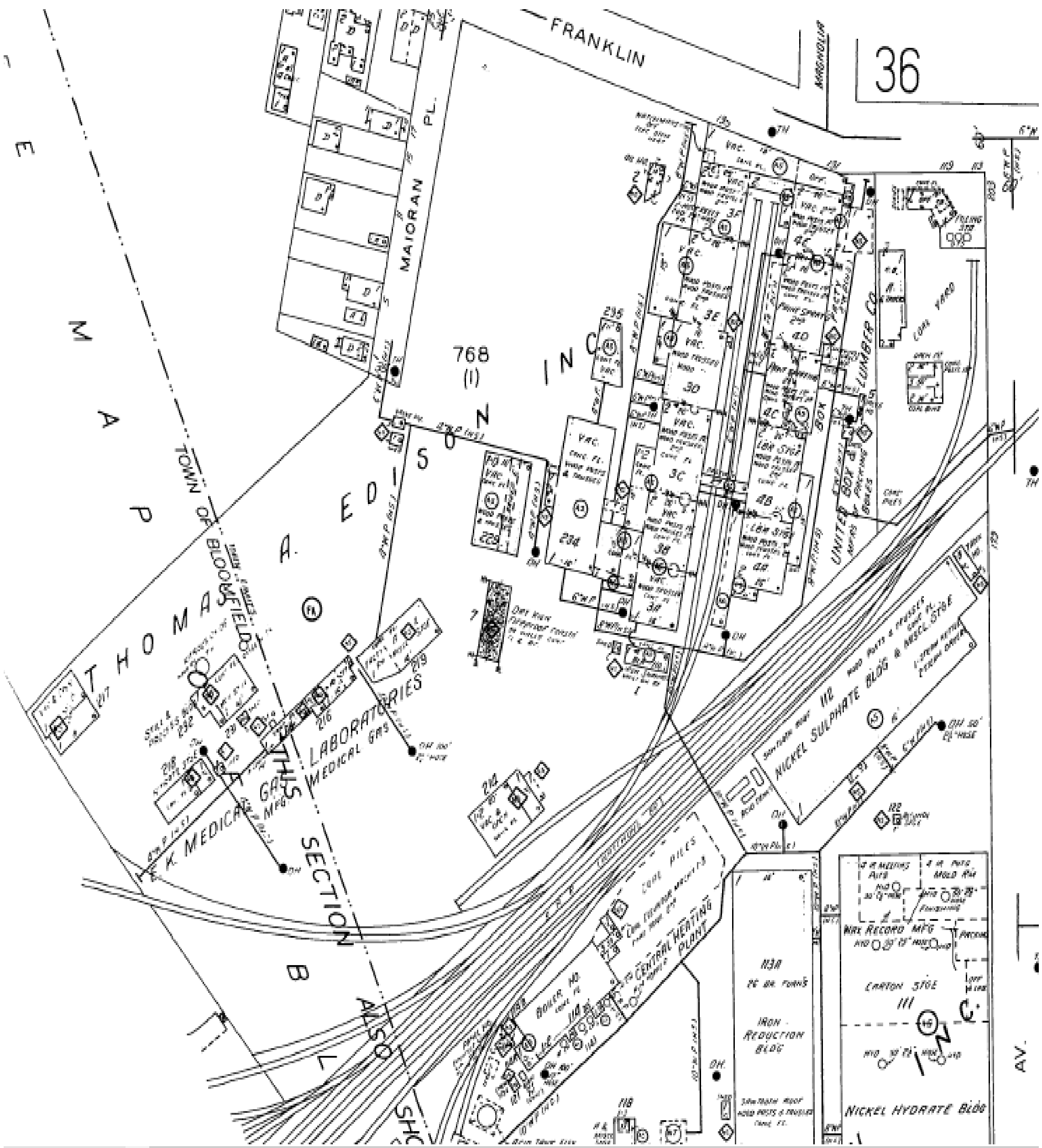
The figure below shows the site layout submitted in the ECRA SES.



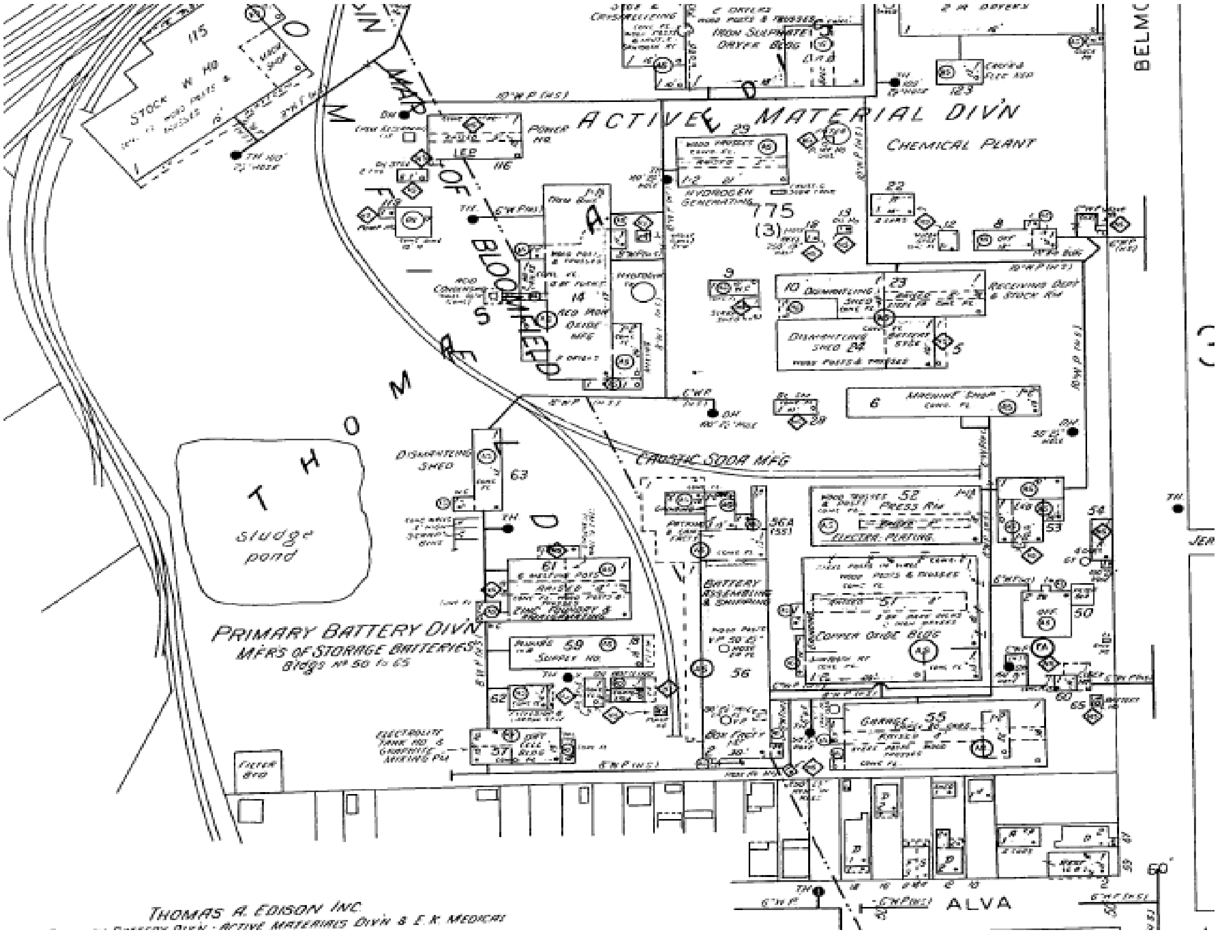
(PAP-00049210)

The Sanborn map from 1938 below showed that the plant was much larger than the plant in the figure from 1986 above. Three divisions were identified at the Thomas A. Edison, Inc. site in Belleville: the E.K. Medical Gas Laboratories north of the railroad tracks manufactured medical gas, the Active Materials Division had a chemical plant, and the Primary Battery Division manufactured storage batteries at the southern end of the site. The Primary Battery Division included a copper oxide building and battery assembly building. The sludge pond was noted to be larger and to the northeast of where it was located in the figure from 1986 above (PAS-00027984).

Sanborn map from 1938, northern half of site: (PAS-00027984)



Sanborn map from 1938: southern half of site: (PAS-00027984)



A site survey map from 1925 shows the same buildings; however, the Active Materials Division was identified as the Chemical Works Division of Edison Storage Battery Co., and the division north of the railroad tracks was identified as the Salvage Division of Thomas A. Edison, Inc. (PAP-000332567).

According to a New Jersey Department of Environmental Protection (NJDEP) Inspection Report, dated August 4, 1987, the plant ceased operation on July 31, 1987, and on the date of inspection no manufacturing activities were taking place. The site was in the process of shuttering, and the process equipment was being dismantled. New raw material was in the warehouse; however, the inspector noted it would be used at the facility in South Carolina (PAP-00050209-10).

<u>Waste Disposal</u>

According to a map dated 1916, the Primary Battery Facility utilized a “filter bed” located on the property of the Storage Battery Business (PAP-00333473). A later map, drawn in 1926, shows the same filter bed (described as “settling beds – Chemical Works”) in addition to “settling tanks – Primary” on the property of the Primary Battery Facility (PAP-

00333479). In 1966, the Primary Battery Facility connected to the sanitary sewer in Bloomfield, and then to the Passaic Valley Sewerage Commission (PVSC) treatment plant. (PAP-00049812; PAP-00333450).

Heavy metals introduced into the plant liquid effluent were settled out to be periodically pumped into the sludge holding area, and eventuall disposed of off-site (PAP-00334371). A letter from McGraw Edison dated May 9, 1973 described the settling basin sludge that was removed from the site every 4 to 6 months. Available information regarding the sludge that was removed from the lagoon/settling pits and disposed off-site is summarized below:

1973: According to the representative evaluation and analysis of the sludge provided by the Primary Battery Facility to Caldwell Trucking Company, Inc., the sludge had the following properties:

- The materials settled in the tanks were a “3.3% slurry (mixture of solid and liquid)”;
- Mercury – 32 mg. per liter of slurry;
- Lead – none;
- Copper – 48 mg. per liter of slurry;
- Inorganic processing waste: “mostly calcium hydroxide Slurry washed from processing tanks daily. Calcium equals 10,470 mg. per liter in the Slurry, accounting for most of the solids.”
- “Additional material is contributed by the plating wash, foundry amalgamation wash, copper oxide stack scrubber and process cooling water.”
- Total solids – 33,500 mg./liter of slurry
- Settleable solids – 30,855 mg./liter of slurry
- Suspended solids – 48 mg./liter of slurry
- Dissolved solids – 2,597 mg./liter of slurry (PAP-00332945-6).

1978: According to a Selected Substance Report for McGraw-Edison Co. based on 1978 figures, 200 lbs. of zinc dross containing mercury was disposed of off-site (PAP-00334492).

1979: According to a Waste Product Survey submitted by McGraw-Edison Company to SCA Chemical Services, the Primary Battery Facility expected to have 200 cubic yards of lime sludge per year for disposal, containing 5-20% suspended solids and over 20% “dissolved solids by weight”. The survey noted that the lime sludge contained 400 ppm copper, 0.4 ppm lead and 1.6 ppm mercury. (PAP-00402950).

1981: According to letters from Peabody Clean Industry Inc., McGraw Edison had the following amounts of “lime sludge, contaminated with heavy metals” for removal and disposal:

- April 1981: 48,000 gallons (PAP-00333237)
- August 1981: 230 cubic yards (PAP-00333242)
- October 1981: 250 cubic yards (PAP-00333257).

The lime sludge and hazardous waste produced by the facility was disposed offsite in the late 1970's and 1980's. The sludge, zinc dross, and other hazardous wastes were noted to contain polychlorinated biphenyls (PCBs), copper, mercury, and lead (PAP-00402947; PAP-00334492; PAP-00334551-52, 57; PAS-00028154-60).

1982: According to NJDEP Division of Hazardous Waste Management waste manifest printouts from 01/01/80 to 12/31/1994 for the Primary Battery Facility, the Primary Battery Facility disposed of 76,000 gallons of waste containing mercury and 5,200 gallons containing lead off-site in 1982 (PAS-00028157-158).

The NJDEP Bureau of Hazardous Waste Generator's Annual Report for the year of 1982 for the Primary Battery Facility reported 115,700 gallons of "hazardous Waste Liquid N.O.S. Lagoon Sludge" transported off-site (PAP-00402947-48).

1983: According to NJDEP Division of Hazardous Waste Management waste manifest printouts from 01/01/80 to 12/31/1994 for the Primary Battery Facility, Edison Battery Products disposed of 10,700 gallons, 56 cubic yards and 18 lbs. of waste containing mercury off-site in 1983 (PAS-00028157-59).

The NJDEP Bureau of Hazardous Waste Generator's Annual Report for the year of 1983 for the Primary Battery Facility reported 10,700 gallons and 74 cubic yards of "hazardous Waste Liquid N.O.S. Lagoon Sludge" transported off-site (PAP-00402974). Sampling results from March 1983 taken from "water from [the] pit arena" reported lead as 0.119 mg/l and mercury as 0.136 mg/l (PAP-00402949).

1984: According to NJDEP Division of Hazardous Waste Management waste manifest printouts from 01/01/80 to 12/31/1994 for the Primary Battery Facility, Edison Battery Products disposed of 31,000 gallons of waste containing mercury off-site in 1984 (PAS-00028157).

1985: According to the NJDEP Hazardous Waste Generator Annual Report for the Primary Battery Facility for 1985, 9 lbs. of waste containing PCBs and 23,400 lbs. of solid waste containing mercury was disposed of off-site in 1985 (PAP-00334551-52).

1986: According to the 1985 NJDEP Hazardous Waste Generator Annual Report for the Edison Battery Products – Cooper Industries, 37,702 lbs. of solid waste containing mercury was disposed of off-site (PAP-00334557).

1987: According to NJDEP Division of Hazardous Waste Management waste manifest printouts from 01/01/80 to 12/31/1994 for the Primary Battery Facility, Edison Battery Products disposed of 36,702 lbs. of waste containing mercury and 259 cubic yards of waste containing PCBs off-site in 1987 (PAS-00028160-161).

Storage Battery Business

According to Edison Storage Battery Company Records, the Storage Battery Business manufactured the chemicals for Edison's "alkaline storage battery" (PAP-00194750). According to *The Submarine Boat Type of Edison Storage Battery* by Miller Reese Hutchison, E.E., Ph.D., Chief Engineer to and Personal Representative of Thomas A. Edison, the active chemicals used in the storage battery were iron oxide and nickel hydrate mixtures of special manufacture by secret process at the Edison Chemical Works, Silver Lake, New Jersey. The iron oxide was powdered, and mixed with a small quantity of mercury (PAP-00334532). The nickel hydrate flakes were produced by filling copper cylinders with very thin alternating layers of nickel and copper by passing the copper cylinders through copper and nickel baths, respectively. The nickel-copper composite sheet is them "stripped from each cylinder" and taken to another department and "placed in crocks containing a solution which dissolves the copper from between the nickel layers", resulting in pure nickel in the "form required for loading the positive tube" of the storage battery (PAP-00334534-35).

Waste Disposal

According to correspondence between representatives of the Storage Battery Business in 1913, the Storage Battery Business utilized "filtering beds" prior to discharge to the brook behind the property (PAP-00334544-545). According to correspondence between the PVSC and the Storage Battery Business in 1926, the Storage Battery Business was discharging wastewater containing iron to the brook lying south of the property of the Storage Battery Business (PAP-00050257; PAS-00028089-90). A memorandum of a conference in 1916 noted that the "use of the open settling tanks or sumps has been abandoned and the material which formerly emptied into the same is emptied alternatively into a pair of closed settling boxes and the overflow from the latter turned into the Belleville sewer" (PAP-00334547).

According to a letter from PVSC to the Storage Battery Business, the settling pits were periodically cleaned out of sludge (PAP-00334678). Sampling from effluent pretreated in the filtering beds / settling pits was collected in 1921 and reported lead and copper as "nil" (PAP-00717650).

A ten-year chemical and inspection record of the Storage Battery Business for the years 1938 – 1948 compiled by PVSC noted that certain events such as "heavy rains" causing flooding at the Storage Battery Business and broken sewer pipes resulted in brief pollution of iron sludge to the storm sewers that led to the Second River (PAS-00028123–30).

According to a Statement forwarded to Ordnance Department regarding the construction of the facilities at the Storage Battery Business, all of the concrete pits in the buildings were waterproof, and "to make these pits absolutely waterproof, the Storage Battery Business installed a drainage system all over the yards" (PAP-00335464). According to a letter between representatives of the Storage Battery Business, a continuous closed circuit apparatus was installed in April 1925 in order to further eliminate iron discharge to the brook, and in September 1925 the Storage Battery Business completed putting in a common drain to collect all waste material at one common source as requested by

PVSC (PAP-00333476). According to another letter between Storage Battery Business representatives, in 1926 an additional pump was installed to address overflow of copper carbonate from the separating solution sumps and a filter press was added such that all of the solution from the Parts Plating Department would have to pass through the filter press before getting to the brook, resulting in all of the nickel carbonate being filtered out (PAP-00333477).

4. Identified COCs

- PCBs (used, detected)
- PAHs (detected)
- Copper (stored, used, detected
- Lead (detected)
- Mercury (stored, used, detected)

Primary Battery Facility

PCBs

The 1985 *Final Draft Site Inspection* noted that the soil had been contaminated with PCBs. The highest concentrations were noted to be in the drainage basins (PAP-00050135-36). Concentrations of the PCBs were not provided in the available references.

A 1987 NJDEP Inspection Report contained a 1985 *Hazardous Waste Generator Report* that noted hazardous waste shipped from the 75 Belmont Avenue property consisted of 9 lbs. of PCBs (PAP-00050226). Waste manifest records from October and November 1987 state 259 cubic yards of PCBs were removed from the Primary Battery Facility (PAS-00028160-61).

According to a letter from Cooper Industries to the NJDEP, dated August 3, 1992, PCBs were detected in Toxicity Characteristic Leaching Procedure (TCLP) composite samples at 2.4 parts per million (ppm) and 3.36 ppm. The letter stated that McGraw-Edison Company did not "utilize transformers, machinery or materials which contained PCBs," and the PCBs were attributed to railroad activities and the soil was disposed off-site (PAP-00332584).

PAHs

According to the 1986 ECRA SES, substances stored on-site included between 1,001 and 10,000 gallons of kerosene (PAP-00049269, 72). According to a 1989 ECRA SES, the facility had been heated with oil and gas for 98 years. Fuel oil storage tanks were located aboveground (PAP-00049812).

According to the August 20, 1986 ECRA SES, in April 1986, a 1,500-gallon underground kerosene storage tank and a 500-gallon underground gasoline storage tank were discovered leaking. Both tanks were removed on April 28, 1986 (PAP-00049278-79).

Copper

According to a December 11, 1990 Response to Information Request for Caldwell Trucking Superfund Site, the Battery Products plant up until 1976 manufactured zinc, copper oxide primary battery. The production process involved the recycling of returned batteries, which required the washing of copper oxide plates and then grinding them into powder. In the course of performing these operations, come heavy metals were introduced into the plant liquid effluent and settled out to be periodically pumped into the sludge holding area, and eventually disposed of off-site. The production of this type of batter was discontinued at the end of 1975 (PAP-00334371).

The Edison Primary Battery Division Annual Reports ad Weekly Averages reported the following amounts of copper (PAP-00333463).

- 5/30/1910 – 2/28/1911: 373,585 lbs. copper scale
- 3/1/1911 – 2/29/1912: 706,741 lbs. copper scale
- 3/1/1912 – 2/28/1913: 986,044 lbs. copper scale
- 3/1/1913 – 2/28/1914: 1,014,255 lbs. copper scale
- 3/1/1914 – 2/28/1915: 1,224,066 lbs. copper scale
- 3/1/1915 – 2/29/1916: 907,690 lbs. copper scale

According to memoranda from the General Manager’s Office of the Primary Battery Division, the Primary Battery Facility “had not been able to keep a sufficient amount of copper scale on hand” in 1917 and the actual amount of stock on hand averaged about one day’s supply only (PAP-00333469; PAP-00333470).

According to corporate meeting minutes from 1918, the Primary Battery Facility cancelled the second car of copper turnings ordered from “Poole Engineering & Machine Company of Baltimore, Md.” (PAP-00333214).

According to Corporate Meeting Minutes from 1920, the Primary Battery Facility was authorized to purchase 50,000 lbs. and 60,000 lbs. of copper in 1920 and 100,000 lbs in March and April 1924 (PAP-00333216; PAP-00333217; PAP-00333454). According to Meeting Minutes from 124, Primary Batter was authorized to enter into an agreement for the provision of cooper scale from March 1, 1925 – February 28, 1926 at an estimated 500,000 lbs. (PAP-00333458-9).

According to the 1986 ECRA SES, the Quality Control Laboratory stored 0.5 kg of cupric oxide (PAP-00049264).

Lead

According to the 1985 SIR, the drainage basins on-site contained high levels of lead. Concentrations of lead in samples from the two drainage basin were 210 and 950 mg/kg (PAP-00050136, 70).

Results from an effluent sample collected October 25, 1985 had less than 0.025 mg/L lead (PAP-00333499).

According to waste manifests from the 1980s and 1990, the following amounts of lead waste was removed and disposed of off- site (PAS-00028154-60).

Waste Mercury Disposed	
Date	**Amount**
10/13/1982	5,200 gallons
10/11/1988	3,493 gallons
10/03/1989	10 cubic yards
09/13-10/01/1991	936 cubic yards
12/16/1992	1,100 pounds

The Soil Sampling Report submitted with the 1986 ECRA SES reported results for soil samples collected in 1984 throughout the site. The maximum detected concentration of lead in surface soil was 2,300 ppm, from a sample located at the eastern corner of the main building along the railroad tracks (see Area 6 in figure above). Only two surface samples (SS-9 and SS-20) contained lead concentrations above 1,000 ppm. The maximum subsurface soil concentration for lead was 570 ppm (PAP-00049318-19, 28-29). Soil samples collected from the edges and within the lagoon detected concentrations of lead up to 920 mg/kg (PAP-00050153, 65; PAP-0004553, 64).

Mercury

As described above, mercury was used at the Primary Battery Facility for the manufacture of zinc-air and copper-oxide batteries (PAP-00334371).

According to a description of operations provided by NJDEP by the Primary Battery Facility in connection with application for Certificates to Operate, mercuric chloride dip was applied with dip tanks that had a “hood ducts, suction fans and roof stacks (PAP-00402937).

According to a July 1987 Evaluation of Mercury and Zinc in Soils, prior to the fall of 1985, the amalgam was produced using a hand casting machine. Because management wished to ensure maximum industrial hygiene, the amalgamation occurred in a Lepel generator (an electric furnace). It appears through mass balance calculation that the procedure of amalgamation using the Lepel generator results in mercury loss, at the same time environmental investigations revealed some visible mercury deposition on the roof of the building where the amalgam was being produced. It would appear that Buildings 55, 56, and 61 are the only locations where mercury was amalgamated. In response to these concerns, Battery Products, Inc. ceased using the Lepel generator, cleaned the roof in accordance with hazardous waste management regulations and obtained an outside supplier who could supply amalgam which met appropriate specifications. (PAP-00332565).

According to a July 1987 Evaluation of Mercury and Zinc in Soils Near the Battery Products, Inc. Facility, Bloomfield, New Jersey, prepared by ENVIRON Corporation, mercury was found to be emitted to the air from the amalgamation process and had been deposited on the soil in the backyards of certain houses fronting on Alva Street and abutting the western boundary of the facility (PAP-00332558). Results for the mercury in

off-site soil were not available. Prior to the fall of 1985, the amalgam was produced in Building 61, and later in Building 56, using a hand casting machine which was located in the electrics lab area, the process was moved a short distance to Building 55 and the amalgamation occurred in the Lepel generator (an electric furnace). It was hypothesized that airborne emissions of mercury may have resulted from the amalgamation process and in response to these concerns, Battery Products, Inc. ceased using the Lepel generator and obtained an outside supplier (PAP-00332565).

The Edison Primary Battery Division Annual Reports ad Weekly Averages reported the following amounts of mercury (PAP-00333463).

- 5/30/1910 – 2/28/1911: 8,700 lbs. mercury
- 3/1/1911 – 2/29/1912: 12,900 lbs. mercury
- 3/1/1912 – 2/28/1913: 18,325 lbs. (and 1,770 lbs. of "mercuric bichl.")
- 3/1/1913 – 2/28/1914: 18,146 lbs. (and 2,454 lbs. of "mercuric bichl.")
- 3/1/1914 – 2/28/1915: 17,550 lbs. (and 3,075 lbs. of "mercuric bichl.")
- 3/1/1915 – 2/29/1916: 12,458 lbs. (and 4,700 lbs. of "mercuric bichl.")

According to corporate meeting minutes, the Primary Battery Facility was authorized to purchase 6,000 lbs. of mercury in 1918 (PAP-00333206-207). However, The Primary Battery Facility's "Schedule of Material Requirements" for the year ending December 31, 1918 did not list mercury as an anticipated major material required for the year in any quantity (PAP-00334658).

According to a June 1981 Selected Substance Report, McGraw-Edison Company reported the following based on 1978 usage (PAP-00334492).

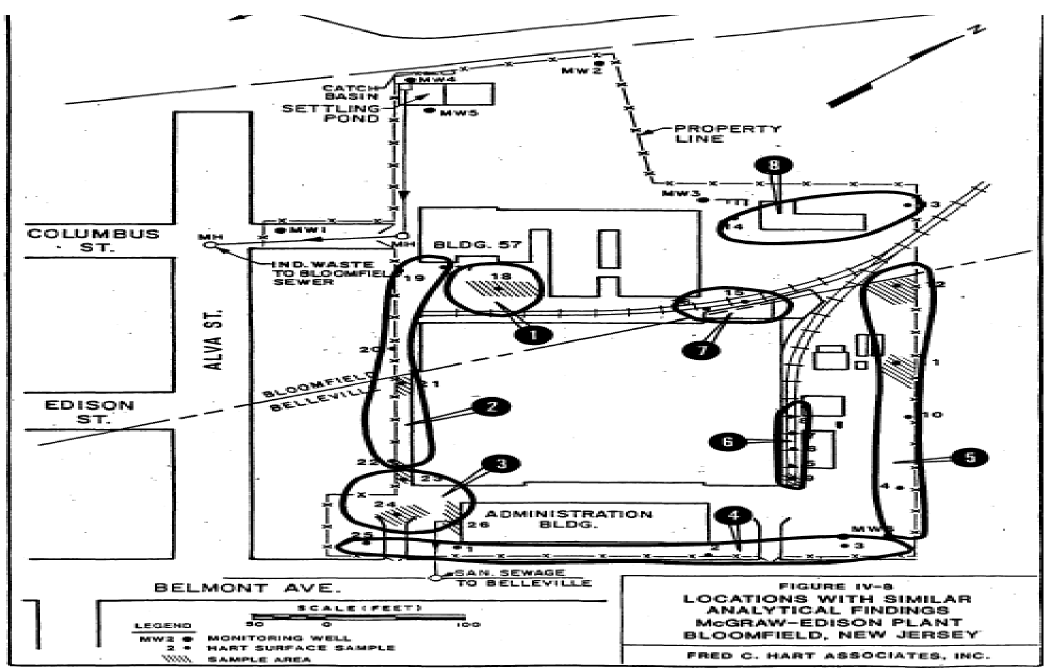
	COMPLETE THE FOLLOWING INFORMATION FOR THE PLANT BASED ON 1978 USAGE	ENTER THE ACTUAL OR ESTIMATED AMOUNTS	USE THE REQUESTED UNITS	ACTUAL	ESTIMATE
THROUGH-PUT QUANTITIES	4. QUANTITY PRODUCED ON SITE	NONE	lbs/yr.		
	5. QUANTITY BROUGHT ONTO SITE	13755	lbs/yr.	X	
	6. QUANTITY CONSUMED ON SITE	13555	lbs/yr.		X
	7. QUANTITY SHIPPED OFF SITE AS (OR IN) PRODUCT	13255	lbs/yr.	X	
	8. MAXIMUM INVENTORY	850	lbs		X
AIR EMISSIONS	9. TOTAL STACK EMISSIONS OF SELECTED SUBSTANCE	.202	lbs/yr.	X	
		.000846	max lbs/day	X	
	10. TOTAL FUGITIVE EMISSIONS OF SELECTED SUBSTANCE	NA	lbs/yr.		
		NA	max lbs/day		
WASTEWATER DISCHARGE	11. TOTAL DISCHARGE OF SELECTED SUBSTANCE INTO SURFACE WATER	NONE	lbs/yr.		
		NONE	max lbs/day		
	12. TOTAL DISCHARGE OF SELECTED SUBSTANCE INTO PUBLICLY OWNED TREATMENT WORKS	.208	lbs/yr.	X	
		.0086	max lbs/day	X	

According to a December 1981 Division Survey for Power Systems Group, the facility reported an annual use of 5,000 lbs. of mercury that they received in flasks and stored in the foundry room (PAP-00049804).

According to a December 1981 Division Survey for Power Systems Group, the facility reported an annual use of 5,000 lbs. of mercury that they received in flasks and stored in the foundry room (PAP-00049804). According to handwritten notes regarding mercury-zinc usage, 2,888 lbs., 3,648 lbs., and 4,180 lbs. of mercury were used in 1982, 1983, and 1984, respectively (PAP-00334688).
According to a memorandum for the Power Systems Group of McGraw-Edison Company from September 6, 1984, about 30 pounds (lbs.) of amalgam were produced each day (PAP-00332576).

The *Final Draft Site Inspection Report*, dated June 14, 1985 (1985 SIR), identified 55-gallon drums with 50% mercury amalgam by weight as a hazardous substance present at the facility. It was noted that mercury turnings were generated on-site and stored in 55-gallon drums. In addition, the 1,922 square feet lagoon was identified as containing mercury sludge (PAP-00050134, 60, 77).

Soil samples were collected from locations across the site in 1984. According to the Soil Sampling Report submitted with the 1986 ECRA SES, the highest concentration of mercury in surface soil was 2,005 ppm, detected between the main building and Building No. 57 (see 18 in Area 1 on-site figure below). The maximum detection of mercury in subsurface soil (0.5-2.5 ft bgs) was 38 ppm (PAP-00049318, 28-29). Soil samples collected from the settling lagoon on August 21, 1984 detected concentrations of mercury ranging from 59 to 2,462 mg/kg. A sample from a drainage ditch located on the northern side of the site detected 4,406 mg/kg mercury (PAP-00050153, 65, 70).



(PAP-00049325)

Based on the figure above, the area of primary concern was Area 1, with the highest levels of mercury and copper contamination between Building No. 57 and the main manufacturing building. It was noted that this area had a concrete surface (PAP-00049324-26). The *Environmental Assessment* by IT Corporation, submitted in the 1985 ECRA SES, stated metals contamination extended to 7.5-9.0 ft bgs beneath the settling pit. In addition, sludge was found in the boring for MW2 (northwest corner of the site), indicating an abandoned, buried settling pit had contamination to 7.5 ft bgs. An oily sheen and petroleum odor were noted at MW3 (PAP-00049569, 76).

The August 4, 1987 NJDEP Inspection Report indicated that the use of mercury ceased in December 1985. At that time, the company began buying the zinc in the size and shape they needed instead of melting it on-site. The mercury was previously required to reduce the grain size of the zinc, making it more desirable for use in the batteries (PAP-00050209-10).

The 1986 ECRA SES contained inventories of substances stored at the plant. The Quality Control Laboratory stored 0.75 kg of mercuric chloride. The foundry contained between 10,001 and 50,000 pounds of mercury zinc. In addition, mercuric chloride was stored in tanks (between 1,000 and 101,000 gallons) and in drums (1,000 and 101,000 lbs.) at the foundry for the zinc anode process (PAP-00049261, 64, 68-72).
A letter from the Edison Battery Products to NJDEP in August 1986 requested that NJDEP cancel 4 Air Certificates because the Primary Battery no longer had those operations as part of their production process, referencing the following processes: zinc hand casting – surface combustion melting furnace amalgam mix; zinc casting table; and zinc anode surface treatment (PAP-00402929).

Records of waste manifests from the 1980s and 1990s document off-site disposal of mercury from the McGraw-Edison plant in the following amounts:

Waste Mercury Disposed	
Date	**Amount**
12/03-04/1991	24 cubic yards
08/24/1990	350 gallons
08/23/1990	1,476 gallons
02/26/1986	20 tons
02/27-28/1986	36 cubic yards
03/04-06/1986	56 cubic yards
04/14/1986	20 cubic yards
09/16/1987	36,702 lbs.
07/18-20/1984	10,500 gallons
02/10/1984	10,000 gallons
07/03/1984	10,500 gallons
04/07/1983	5,200 gallons
10/01-14/1982	76,000 gallons
01/17/1983	5,500 gallons; 38 cubic yards
01/18/1983	18 cubic yards; 18 lbs.

(PAS-00028154-60)

According to a September 26, 1988, letter from SESI to Cooper Industries, SESI noted free-phase mercury in soil samples from boring 9 to a depth of approximately 15.5 ft bgs. The mercury appeared to stop in a stratum that consisted of silt with a trace of fine sand and clay. SESI reported that the mercury contamination near boring 9 was a localized issue; however, a figure with the boring location was not provided. Concentrations of mercury in this boring ranged from 3.8 to 10,500 ppm (PAP-00049846, 70).

According to the 2017 Final RI Report, the maximum concentration of mercury detected in soil at the former chemical plant was collected on July 7, 2011 at 874 mg/kg from a depth of 6-6.5 ft bgs (PAP-00334914).

Storage Battery Business

PAHs

The 2017 Final RI Report detailed detections of PAHs in soil at the former chemical plant. The highest concentrations of (benzo(a)pyrene at 0.39 milligrams/kilogram (mg/kg) and benzo(b)fluoranthene at 0.69 mg/kg) were detected at a sample depth of 1.8 - 2.8 feet below ground surface (ft bgs) (PAP-00334938). The 2017 Final RI Report attributed the PAHs (except 2-methylnaphthalene) concentrations in soil to historic fill (PAP-00334877). The elevated concentrations of 2-methylnaphthalene (35 mg/kg) were attributed to an unidentified release of diesel or No. 2 fuel oil (PAP-00334868, 78)

Copper

Copper was used in the manufacturing of nickel hydrous flake as filler between the nickel flakes that could be dissolved away in solution as described in the *Submarine Boat Type of Edison Storage Battery* by Miller Reese Hutchison, E.E., Ph.D. (PAP-00334535).

According to an undated memorandum titled "Instructions for Keeping Various Solutions Under Control for The Production of Nickel Flake", the solution used to produce the nickel flake required no more than 0.32 grams of copper per one liter of solution (PAP-00335448). An internal Edison Storage Battery Company memorandum noted an annual production of 225,000 lbs. of nickel flake in 1919 (PAP-00335470).

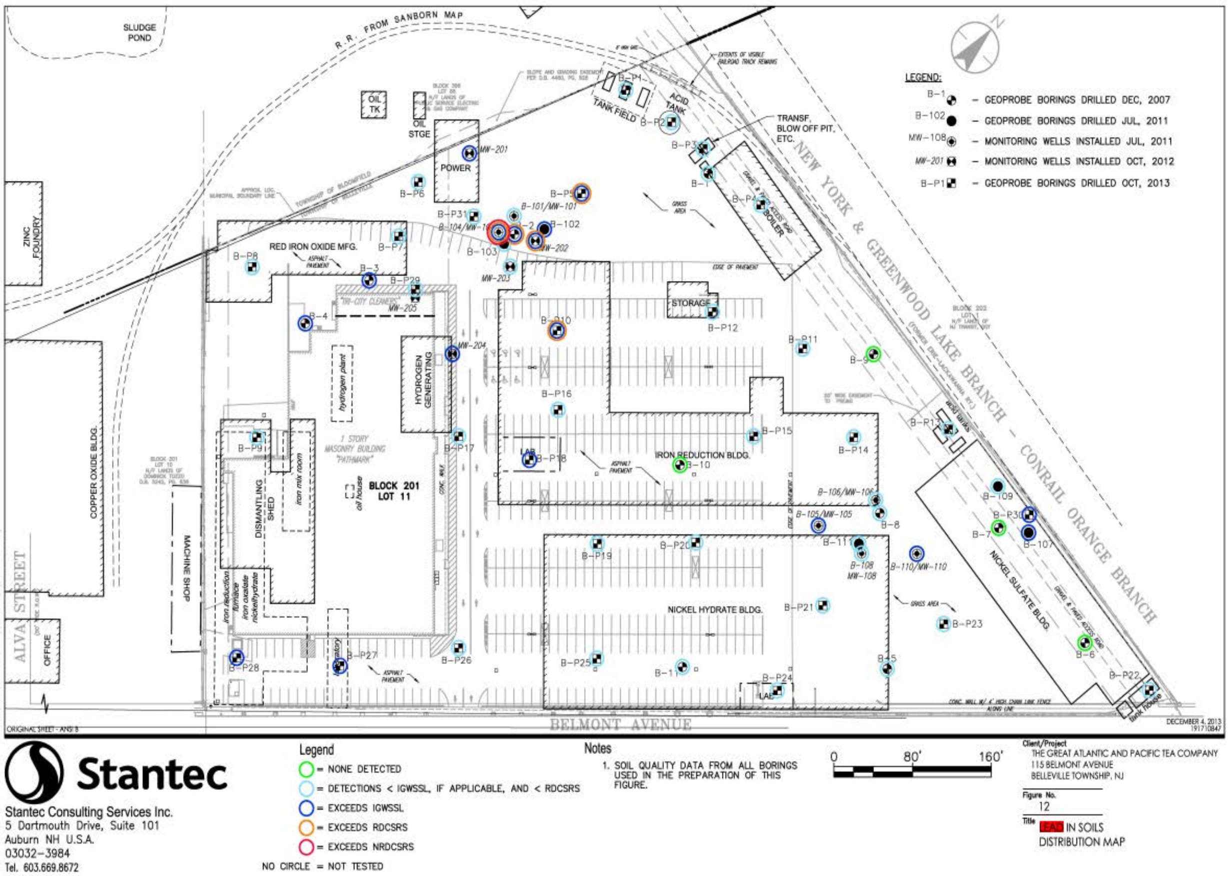
According to the 2017 Final RI Report for Pathmark Grocery Store, the max concentration of copper (1,200 mg/kg) came from sample B-107 collected on July 20, 2011 from a sample depth of 6 – 6.ft (PAP-00335204).

Lead

According to the 2017 Final RI Report for Pathmark Grocery Store, a 2007 Phase II ESA Investigation reported soil samples with lead at concentration above the NJDEPS's most stringent Direct Contact Soil Cleanup Criteria, but below the NJDEP's Non-Residential Direct Contact Soil Cleanup Criteria (PAP-00334848).

The maximum concentration of lead detected in soil at the former chemical plant was 1,710 mg/kg at a depth of 6-6.5 ft bgs (PAP-00334913). Laboratory results from soil samples collected in 2011 and 2012 also showed elevated levels of lead at two sample locations, with concentrations of 764 mg/kg and 633 mg/kg, respectively (PAP-00334865).

The figure below depict the locations of lead detected in soil at the Storage Battery Business property (PAP-00335218):



Mercury

According to *The Submarine Boat Type of Edison Storage Battery*, dated October 1915, by Miller Reese Hutchison, E.E., Ph.D., Chief Engineer to and Personal Representative of Thomas A. Edison, mercury was used with the iron plate for better contact, to promote chemical action, and to reduce internal resistance. It was also stated that the iron oxide manufactured at the Edison Chemical Works Silver Lake plant was "mixed with a small quantity of mercury" (PAP-00334531-32).

In a document titled, "Edison Chemical Works Division, Raw Materials Requirements" and dated August 1, 1918, the amount of mercury required for one month was 2,558 lbs. (PAP-00333465).

According to the 2017 Final RI Report for Pathmark Grocery Store, the max concentration of mercury (874 mg/kg) came from sample B-107 collected on July 20, 2011 from a sample depth of 6 – 6.ft (PAP-00335204).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury[2]. Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards[4].

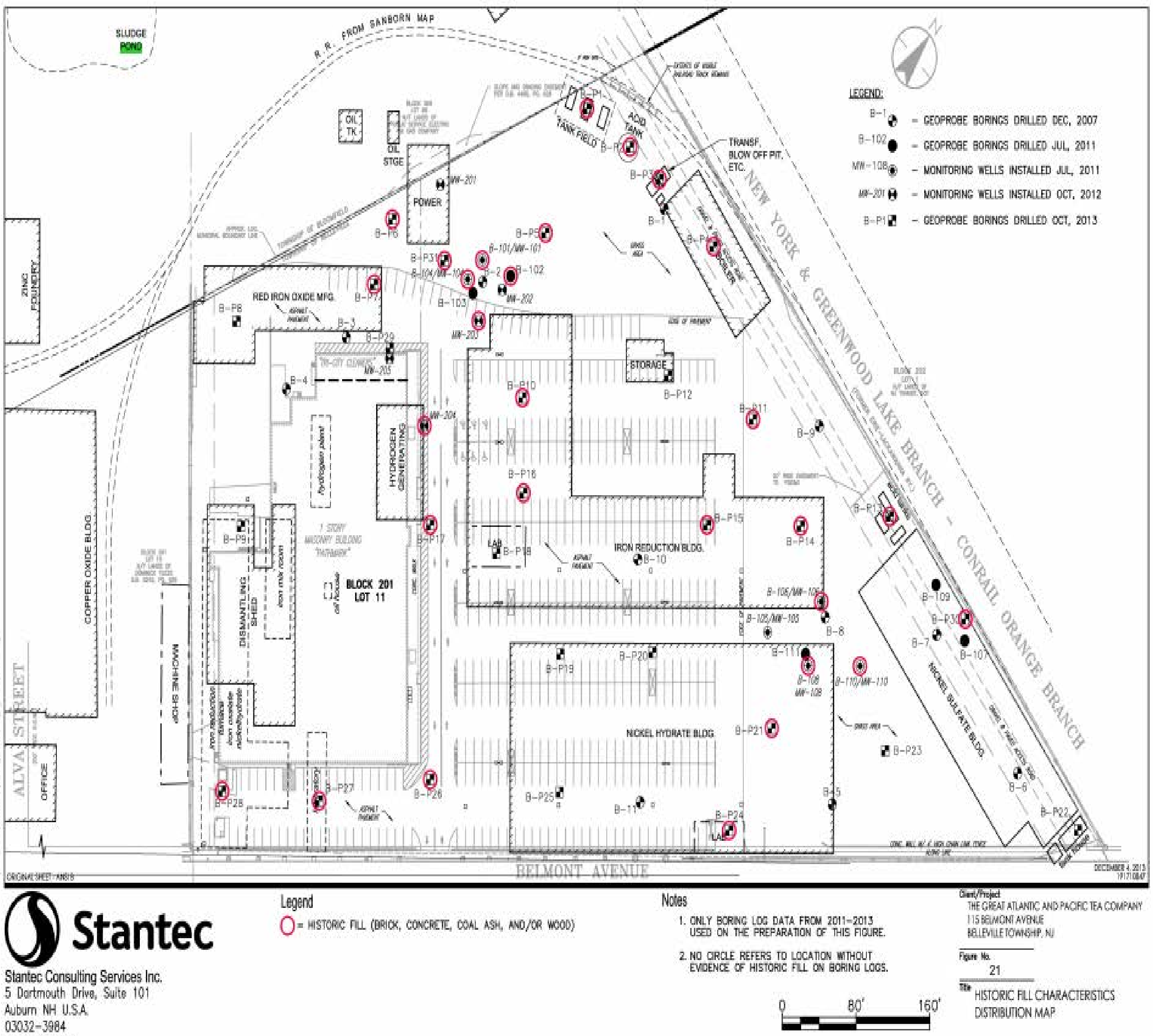
The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00049328-29, PAP-00050170; PAP-00334938).

COCs Found in Onsite Soils		
COC	**Primary Battery Max Detected Concentration**	**Storage Battery Max Detected Concentration**
Lead	2,300 mg/kg	1,710 mg/kg
Copper	80,000 mg/kg	1,200 mg/kg
Mercury	4,406 mg/kg	874 mg/kg
Benzo(a)anthracene	No Data	0.43 mg/kg
Benzo(a)pyrene	No Data	0.39 mg/kg
Benzo(b)fluoranthene	No Data	0.69 mg/kg
Benzo(k)fluoranthene	No Data	0.25 mg/kg
Dibenzo(a,h)anthracene	No Data	0.037 mg/kg
Indeno(1,2,3-cd)pyrene	No Data	0.10 mg/kg

[1]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #41 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] NJDEP, *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Storage Battery Business

According to a 2017, Final RI Report for Pathmark Grocery Store (Battery Storage Business) historic fill impacted the concentrations of metals and PAHs across the site (PAP-00334844). Based on the presence of fill material (i.e., brick, concrete, coal ash, wood, etc.) observed in borings across the site and the lack of a correlation between the elevated concentrations and individual areas of concern, the 2017 Final RI Report attributed the metals and PAHs (except 2-methylnaphthalene) concentrations in soil to historic fill (PAP-00334877). Boring log data from samples taken between 2011 and 2013 show characteristics of historic fill as identified in the "Historic Fill Characteristics Distribution Map below (PAP-00335227).



The 2017 Final RI Report for Pathmark Grocery Store (Battery Storage Business) also noted that Historic Fill was located throughout, or across, the entire Site and impacted with levels of metals and polycyclic aromatic hydrocarbons (PAHs) above Standards (PAP-00334844). The 2017 Final RI Report concluded that the historical operations areas do not show evidence of spills or releases, and, therefore, are not considered as individual or specific AOCs; however, Historic Fill is an AOC. The concentrations of the various metals are also consistent across the Site (PAP-00334877).

5. COC Pathways

Sanitary Sewer

Primary Battery Facility

Records regarding when the Primary Battery Facility connected to a sanitary sewer are not clear, but negotiations with Belleville, Bloomfield and East Orange for the construction of a storm water sewer to replace Meadow Brook were concluded in 1929 (PAP-00717646). According to an August 1926 Statement from Thomas A. Edison Incorporated, 25% the total volume of industrial waste is discharged into the brook. The other 75% discharged into a man-hole in the private drain located within the town of Bloomfield, west of the property line (PAP-00717640).

The 1989 ECRA SES Part 2 noted that industrial waste was discharged from the primary battery facility to the PVSC from 1966 to 1987. After 1987, only sanitary waste was discharged to the PVSC. The industrial waste was listed as containing heavy metals from 1966 to 1979. Prior to 1966, it was noted that a septic system and settling ponds were used for the sanitary and industrial waste (PAP-00049812).

A letter dated November 12, 1965 from Thomas A. Edison Industries to the Town of Bloomfield stated a new sewer line would be attached from the settling ponds to a new manhole (PAP-00333478). According to correspondence between the Town of Bloomfield and a McGraw-Edison Plant Engineer, industrial discharge into the Bloomfield sanitary sewer was approximately 32 gallons per minute in 1966, for 236 working days in the year (PAP-00333510).

The 1985 SIR noted that the facility was permitted to discharge into the Bloomfield/Belleville sewer system. The permit to the PVSC was for “runoff from roof, non-contact cooling water, AC, drainage, etc.” (PAP-00050136-37).

A Selected Substance Report estimated an average volume of 75,000 gallons of wastewater discharged to PVSC per day based on 1978 usage (PAP-00334489). The Selected Substance Report reported a total annual discharge of mercury into publicly owned treatment works in the amount of .208 lbs. (.0086 max lbs./day) based on 1978 usage, and the estimated average volume of wastewater discharged to PVSC per day. No surface water was reported (PAP-00334489-92).

A PVSC Heavy Metals Source Determination Study, Phase II, dated April 1980, stated the facility discharged into the PVSC system at a rate of 0.1090 million gallons per day. The report included the following results for effluent from the McGraw-Edison-site:

Effluent in 1980		
Metals	**mg/L**	**lbs/day**
Copper	0.144	0.131
Lead	0.300	0.273
Mercury	0.025	0.0227

(PAS-00028222)

A letter from the Primary Battery Facility Plant Manager to PVSC in February 1981 stated that the annual flow at Outlet Number 002 to Belleville was confirmed to be 630,000 gallons, which divided, by 240 working days averages 2,625 gallons per day. There are no process wastes or non-contact cooling water involved in this outlet. The letter noted the intent to later provide a flow meter in the discharge line at Outlet Number 001 to the Bloomfield System (PAP-00402951). Note: The PVSC Sewer Connection Application identifies the daily flow at outlet 001 to be 50,865,409 gallons and at outlet 002 to be 630,000 (PAP-00402962). This letter clarifies that these values are the *annual* flow, as opposed to the daily flow, consistent with the annual usage amounts reported at PAP-00402960.

According to an October 1980 Chemical Neutralizing Pit Letter, the Primary Battery Facility noted that most of the water going to the pit is clear cooling water. The remaining water was process effluent which contains suspended lime particles. The pit was used to settle out the particles of lime and the discharge goes into the Bloomfield Sewer System. The letter noted that PVSC was advised of the laboratory analysis results of mercury at 42.150 ppm and that PVSC concluded the pits and discharge posed no immediate hazard because the materials were below PVS limits for waste water (PAP-00402953-55).

According to a PVSC Sewer Connection Application, dated February 4, 1980, 51,495,409 gallons of industrial and domestic water were discharged to the sanitary sewer in 1979. The majority of this volume was industrial waste (50,865,409 gallons) that was discharged through Outlet 001 to the Bloomfield sewer, while the rest (630,000 gallons) was sanitary waste that was discharged through Outlet 002 to the Belleville sewer. Concentrations detected in samples collected in 1980 from Outlet 001 were 0.748 mg/L copper and 0.15 mg/L mercury (PAP-00402951; PAP-00402957; PAP-00402960, 62, 66). Based on a process diagram from 1980, a pretreatment plant was used for the waste (i.e., non-contact cooling water, roof leaders, and process waste) sent to Bloomfield, and both Belleville and Bloomfield sewers went to the PVSC (PAP-PAP-00725624).

A Division Survey for the Power Systems Group, dated December 23, 1981, listed 260,000 gallons of process water and 15,000,000 gallons of cooling water discharged to the PVSC sanitary sewer each year. The pretreatment was identified as settling weirs. It was stated that waste was not discharged to the storm sewers (PAP-00049806). A

PVSC permit noted no process water was discharged to the sewer in 1984 (PAP-00333484).

According to a PVSC Application, the Primary Battery Facility has two outlets. An industrial waste filled chamber composite Outlet 01402141 with a daily flow of 50,856,409 gallons and a sanitary sewer Outlet 01402142 with a daily flow of 630,000 gallons (PAP-00333486; PAP-00402962).

According to a 1980 PVSC Sewer Connection Application, the Primary Battery Facility discharged 51,495,409 gallons of industrial and domestic water to the sanitary sewer in 1979 (PAP-00402960).

The maximum results from plant effluent samples reported on June 30, 1984 were 0.026 mg/L copper and 0.059 mg/L mercury. Lead was not detected (less than 0.025 mg/L) (PAP-00334524).

According to a letter from the Primary Battery Facility to PVSC, the Primary Battery Facility discharged 35,87,301 gallons during the period from the Fourth Quarter of 1984, thru the Third Quarter of 1985. The Primary Battery Facility representative explained that the discrepancy between the PVSC's reading of 110,000,000 gallons of effluent and the Primary Battery Facility's reported amount was likely due to the fact that the Primary Battery Facility had a "Sigmamotor LMS-500 Flowmeter, which charts flow through the Weir and Bubbler principle. Due to this, any abnormal amount of water over the top of the Weir will result in a greatly accelerated total volume flow". The letter further noted that the flowmeter reading at the end of October, 1985 was 385,281 gallons. (PAP-00402971).

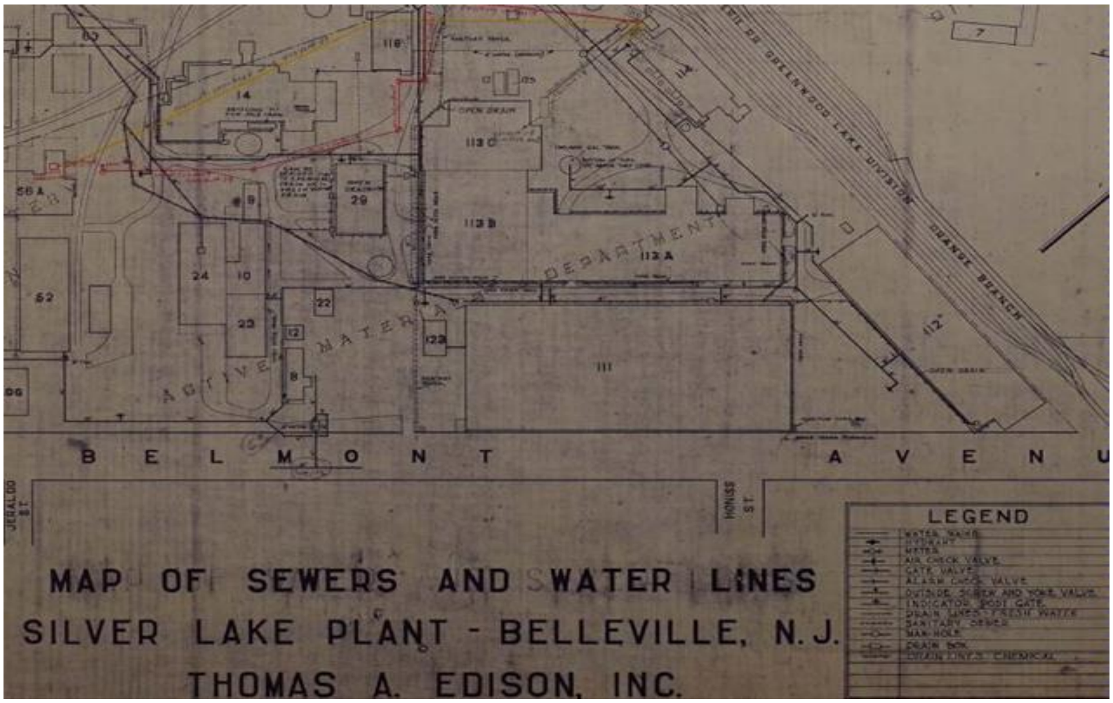
Results from an effluent sample collected October 25, 1985 reported 0.052 mg/L copper and less than 0.025 mg/l lead (PAP-00333499).

A letter from the Primary Battery Facility to PVSC in June 1986 referred to a "violation of high pH in the effluent stream, which empties into the Bloomfield Sanitary Sewer on Alva Street" and proposed the following solutions: 1) "a more often clean out of certain manholes and catch basins" – on a "monthly basis"; and 2) the "addition of Muriatic Acid into the sewer line most affected by high pH" to help "maintain the allowable pH range" (PAP-00402967).

According to a letter from the Edison Battery Products to PVSC, the Primary Battery Facility's well water system had not been functioning since mid-November, due to a pump problem and as a result, there was a plus 3,255,559 gallon difference in their discharge (PAP-0040286). The volumes discharged through Outlet 02404620-41009-0201 reported in a user charge self-monitoring report for the period January 1 through March 31, 1986 were 6,449,000 gallons based on the flow meter and 3,693,441 gallons based on city water measurements. This discrepancy in measured volumes was attributed to a broken pump. The sanitary waste was 194,418 gallons through Outlet 01404620-41009-0201 (PAP-00402968-70).

A letter from the Primary Battery Facility to PVSC noted that the Primary Battery Facility's flowmeter reading on March 7, 1986 was 396,743 gallons (PAP-00402971).

Based on a PVSC Sewer System Evaluation Survey, dated July 1979, the site was located within the Second River Union Outlet Overflow District (PAS-00028203).



Battery Storage Business

According to correspondences between Passaic Valley Sewerage Commissioners (PVSC) and the facility in 1926, the Edison Chemical Works Division of Silver Lake was polluting a brook to the south of the plant with wastewater from their settling ponds (PAP-00050257; PAS-00028089-90). By 1938, this wastewater was discharged to a storm sewer that led to the Second River. In 1942, the site was connected to an industrial sewer that carried its waste to the Belleville sanitary sewer, according to an entry in the record of ten years of inspections performed by the PVSC on the Edison Company, Storage Battery Division, in Silver Lake, Belleville, dated June 15, 1948 (PAP-00050260-63).

A document titled Chemical Plant Discharge, dated July 24, 1926, listed 59,847 gallons discharged per day containing 1.959 lbs. of copper (PAP-00334684).

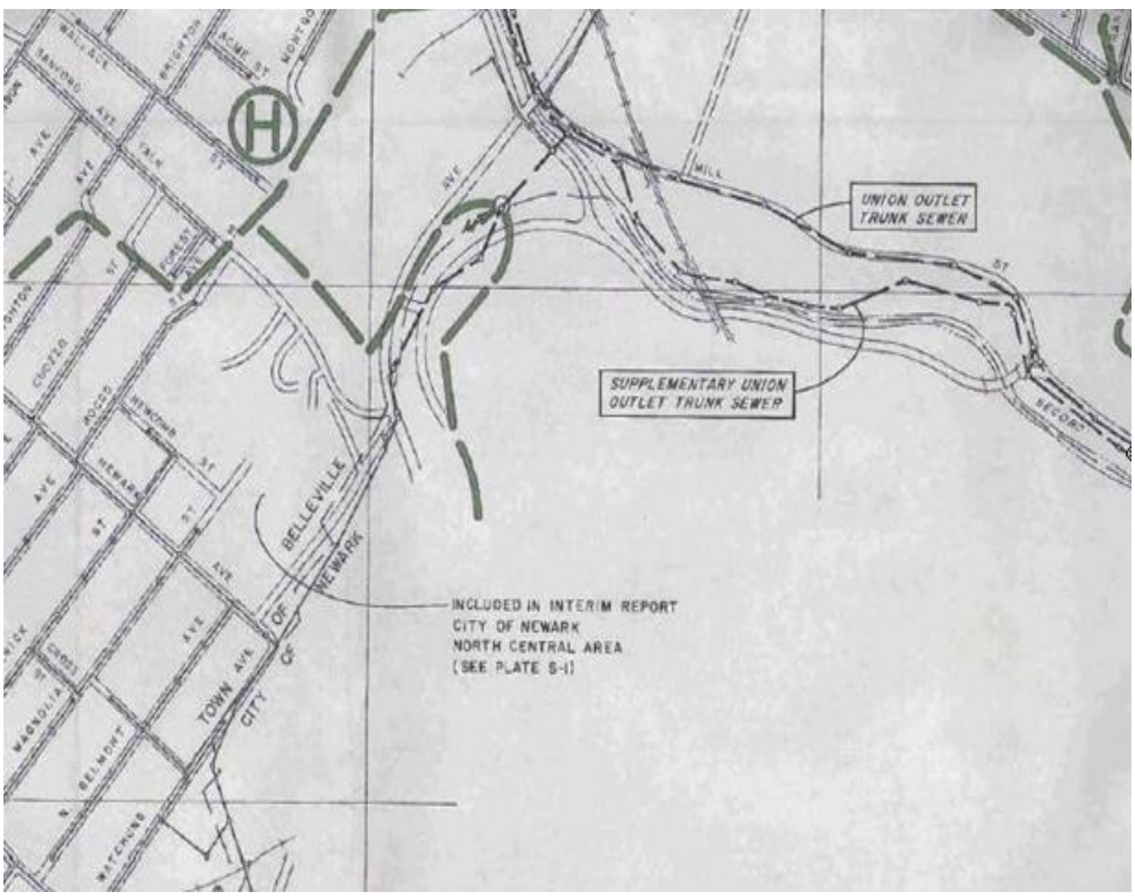
According to Storage Battery water sample results reported by F.S. Schimerka on November 17, 1926, copper and lead was absent from water samples taken from the Laboratory Outlet, Works Outlet 8" Universal Pipe, Works Outlet 8" Steel Pipe and Gate 45 (PAP-00334685). The sample results did not mention mercury results.

A March 23, 1942, entry in the record of ten years of inspections performed by the PVSC on the Edison Company, Storage Battery Division, in Silver Lake, Belleville, dated June 15, 1948, noted that the facility was connected to an industrial sewer that carried its waste to the Belleville sanitary sewer (PAP-00050262-63). According to the undated "Map of Sewers and Water Lines, Silver Lake Plant - Belleville, NJ," this facility identified as the Active Materials Department was connected to the sanitary sewer via a connection on Belmont Avenue (PAP-00333512).

Combined Sewer Overflow

Primary Battery Facility

The Primary Battery Facility was located within the Second River Union Outlet Overflow District. According to the *Report upon Overflow Analysis to Passaic Valley Sewerage Commissioners* for the Second River Union Outlet, prepared by Elson T. Killam Associates, Inc. in 1976, "under normal dry weather flow conditions, the flow is diverted to the PVSC interceptor via the regulator. During periods of rainfall, none of the sanitary flow enters the interceptor. The entire flow is discharged through the outfall line into the Passaic River" (PAS-00028167). The report noted that the District covered 10,227 acres (PAS-00028170).

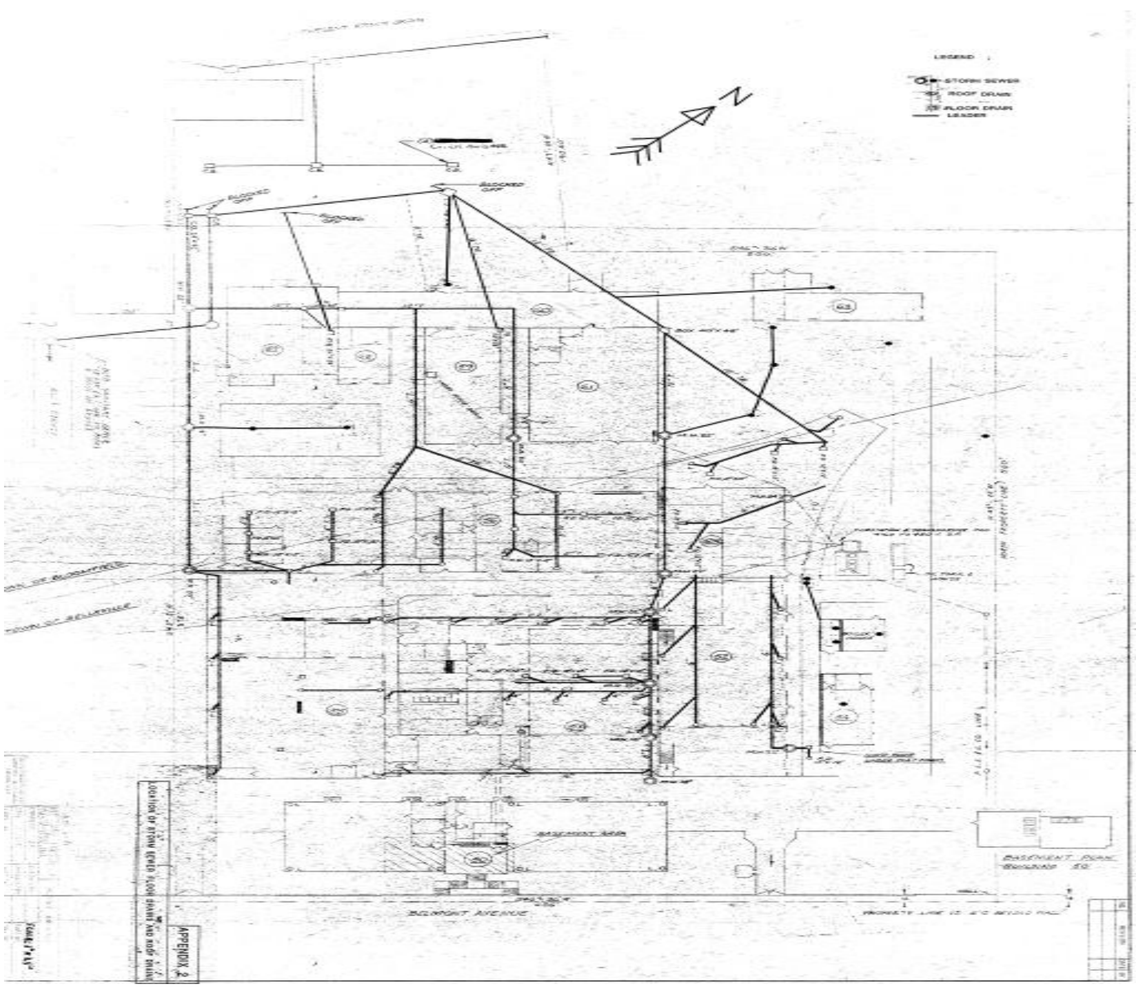


(PAS-00028203)

Storm Sewer

Primary Battery Facility

The June 1985 Final Draft Site Inspection noted the site was gently sloped (0-3%) with a slight grade (5-8%) on the Belmont Avenue border (PAP-00050160). According to the 1986 ECRA SES, the Bloomfield area received approximately 47 inches of precipitation per year. Due to buildings and paved surfaces at the site, most water drained into the sewage systems of the Cities of Bloomfield and Belleville that were controlled by PVSC (PAP-00049309).
Storm sewer and floor drain Locations are provided below.



(PAP-00049218)

Storage Battery Business

A record of ten years of inspections performed by the PVSC on the Edison Company, Storage Battery Division, in Silver Lake, Belleville, dated June 15, 1948, documented the investigation of contamination entering the Second River. In 1938, it was suspected that iron hydroxide from the Edison facility was being discharged from the Meadow Brook

storm sewer into the Second River. On June 30, 1938, sludge from an overflowing a settlement pit at the Edison Facility was traced from the Second River through the storm sewer. The overflowing sludge was diverted to an alternate settlement pit, but the storm sewer was still contaminated with iron. In 1939, it was determined that underground seepage of dissolved iron from the seepage lagoon was entering the storm sewer. In April 1939, the Edison Company removed the iron mud from the Meadow Brook storm sewer, treated waste in settlement pits to eliminate use of the seepage lagoon, and replaced a cooling water line that had been leaking and bringing iron from the ground to the storm sewer. Sampling data for the composition of the sludge and wastewater was not available (PAP-00050260-61).

Source: Bloomfield Sewer Map 1894 (annotated)
(PAS-00027741)

Several short term releases of iron waste to Belmont Avenue storm sewer and the Meadow Brook storm sewer occurred from 1940 to 1947 due to breaks in the sewer lines or heavy rains causing flooding. In 1946, contamination of the Second River from the Meadow Brook storm sewer was noted and found to be caused by a blocked sanitary sewer near the Edison plant that was subsequently removed (PAP-00050268).

On May 12, 1948, “exceptionally strong iron wastes were found flowing into the Second River from the Meadow Brook storm sewer of such intensity that Second River looked like a river of blood all the way down to its confluence with the Passaic River.” The discharge emanated from Edison Storage Battery Division, Belmont Avenue, Belleville facility. The cause was a waterline break that resulted in releasing 100,000 gallons of water that flooded all north side buildings, undermined the buildings and producing a 30-foot hole in the yard and resulting in subsequent collapse of all three industrial sewers. Chemicals, sand, and finished chemical materials were washed into the sewer and caused a blockage. The broken water line was repaired with a sleeve and the pipes

broke again. The large hole filled with an acid and iron solution. A pump line from the hole drained the mixture into the clear water line directly to the storm sewer and into Second River. The waste could not be put into the sanitary sewer until new sewer pipes had been installed. The acid corroded the pumps and caused them to fail, and by June 2, 1948, the sewer line was repaired (PAP-00050268-69).

Direct Release

The 1985 SIR identified the Branch Brook and Passaic River as potentially impacted by site contamination. The Branch Brook was 0.5 miles and the Passaic River was 1.5 miles from the site (PAP-00050138).

Storage Battery Business

According to correspondence between representatives of the Edison Chemical Works in 1913, drainage from filter beds at the Silver Lake facility was discharged to the brook behind the property (PAP-00334544-45). Blueprints of the property in 1916 and 1919 showed piping from filter beds, settling tanks, and settling beds from the Chemical Division, which led to the brook in 1916 and a 36" concrete pipe that emptied into the brook in 1919 (PAP-00333473, 74). In addition, a PVSC questionnaire submitted by the Storage Battery Business in 1925, listed the daily volume of industrial waste as 160,000 gallons, which was "discharged in brook" (PAP-00333531).

According to the 1986 GIS SES, the mercury zinc amalgamation process periodically resulted in atmospheric escape and disposition of elemental mercury onto plant property and the process was terminated in 1985. The Battery Products Division of Cooper Industries, Inc. removed the external roof materials and performed internal surface cleaning to address the mercury emission (PAP-00049278).

A PVSC report dated February 6, 1926 identified Edison Chemical Works of Silver Lake as a known polluter discharging "iron liquors, sometimes acid" to a river (PAS-00028089). According to a letter from Edison Storage Battery Co. to the PVSC, dated August 6, 1926, the Edison Chemical Works Division of Silver Lake was identified as polluting a brook to the south of the plant. The brook was noted to flow into the Passaic River. The letter stated that the plant was discharging 10,000 gallons of solution per hour, and the acid content was a maximum of 0.07 percent sulfuric acid. The facility planned to connect pipes that drained acidic water to the pipe that discharged straight to the brook instead of passing all of their wastewater through pits, leading to the high iron content (PAP-00050257; PAS-00028089-90).

Lagoon

Primary Battery Facility

According to the 1986 ECRA SES, the sedimentation impoundment overflowed on May 30, 1984, due to a blockage of the discharge line during extremely heavy rains. The overflow accumulated in a neighboring homeowner's excavation for an in-ground pool. Use of the settling pond was discontinued, and the discharge from the swimming pool was pumped into the local sewer system (PAP-00049278). According to an August 3,

1989, ECRA SES, NJDEP issued a Directive Letter to McGraw Edison on June 6, 1984, to cease operation of the unlined pretreatment lagoons (PAP-00049811). The 1985 SIR stated that the lagoon had been pumped out and would be filled and paved over, and drums hauled away. The lagoon was noted to be lined with clay (PAP-00050135, 37). The lagoon soil has been contaminated with PCBs, volatile organics, and metals including mercury and lead. Drainage basins contained highest levels of PCBs and lead (PAP-00050135-6). Concentrations detected in the sludge were reported in a July 16, 1984 NJDEP memorandum as 6,240.0 ppb mercury and 110,000.0 ppb lead (PAP-CONF-00725620).

In 1966, the Primary Battery Facility connected to the sanitary sewer in Bloomfield, and then to the Passaic Valley Sewerage Commission (PVSC) treatment plant. (PAP-00049812; PAP-00333450).

Battery Storage Business

The ten-year record of PVSC inspections described a seepage lagoon that was installed by the Edison Company in approximately 1936. The lagoon could dispose of 35,000 gallons of waste in a few hours. After it was noted that contaminated water from the seepage lagoon was entering the Meadow Brook storm sewer, the facility negotiated with the City of Belleville for use of their sanitary sewers and returned to using settlement ponds for the waste water (PAP-00050261-62).

Samples of the settling pit were collected January 18, 1983 and reported up to 75.53 mg/kg mercury and 10.03 mg/kg lead (note units of measure were not clearly identified). Copper was not reported (PAP-00725623).

6. Regulatory History/Enforcement Actions

Inspections & Violations

Primary Battery Facility

An August 4, 1987, NJDEP Inspection Report stated that the facility did not have a hazardous waste management program consistent with hazardous waste regulations. The inspector noted that the Bureau of Industrial Site Evaluation was aware of the situation and was ensuring that NJDEP accomplished the intent of ECRA (PAP-00050211). The inspector noted that the company would have been issued a Notice of Violation, but they had ceased operations and were not undergoing an NJDEP supervised cleanup pursuant to ECRA law. The inspector noted that, “In a word, the facility slipped through the system” (PAP-00050213).

According to a 1989 ECRA SES Part 2, NJDEP issued a Directive Letter to McGraw Edison on June 6, 1984, to cease operation of the unlined pretreatment lagoons (PAP-00049811). Use of the settling pond was discontinued, and the overflow discharge that had entered the swimming pool was pumped into the local sewer system (PAP-00049278).

On November 9, 1984, NJDEP issued an order directing McGraw-Edison Company to conduct an investigation to define the extent of soil and groundwater contamination at the Bloomfield facility (PAP-00049543).

Storage Battery Business

According to the PVSC ten-year inspection record, PVSC issued a notice to desist pollution to Edison Chemical Company at Belleville on May 1, 1939 (PAS-00028126).

In a letter from H.T. Leeming to Mr. Saltzman, dated August 20, 1913, it noted that the health officer of Bloomfield, NJ called complaining about polluted waters through the creek at the rear of the Silver Lake plant. The health officer claimed that the facility's filters should retain the matter which exuded an obnoxious odor and affected animals drinking water from the creek. Mr. Saltzman was asked to examine the condition and submit a report (PAP-00049892).

As noted above, PVSC compiled a record of ten years of inspections performed on the Storage Battery Business dated between 1938 and 1948 (PAS-00028123-133). According to the PVSC ten-year inspection record, PVSC issued a notice to desist regarding pollution to Edison Chemical Company in Belleville on May 1, 1939 (PAS-00028126).

Permits

Primary Battery Facility

An August 3, 1989 ECRA SES Part 2 identified the following NJDEP Air Permits for the facility:

ATTACHMENT 1

Permit No.	Date of Approval	Expiration Date
065776	-------	08-01-88
046573	11-26-80	11-26-90
046494	08-13-80	10-20-89
046572	11-26-80	11-04-89
046356	08-13-80	10-20-89
045925	07-08-80	09-16-89
045897	07-07-80	07-07-90
045345	05-12-80	Cancelled 08-05-86
045344	05-12-80	Cancelled 08-05-86
043482	07-23-79	07-21-89
033861	10-28-77	04-19-88
022937	06-01-76	09-05-90
022773	09-09-76	09-09-91
037862	03-30-78	03-29-88
036426	12-29-77	09-15-88
036427	12-29-77	09-15-88
034172	08-15-77	03-30-88
022774	09-09-76	09-09-91
036431	09-15-78	09-15-88
036433	12-29-77	09-15-88
065775	---	08-19-88
036425	12-29-77	09-15-88
036428	12-29-77	09-15-88
036242	12-29-77	09-15-88
036240	12-29-77	Cancelled 08-05-86
046507	12-12-80	12-12-90
036430	12-29-77	09-15-88
036241	12-29-77	09-15-88
036239	01-03-78	09-15-88
030493	01-20-77	07-01-87
036238	12-29-77	09-15-88
036980	12-29-77	Cancelled 08-05-88

(PAP-00049818)

PVSC sewer connection permit number 01402142 was effective March 16, 1981, and expired March 16, 1986. This permit was an industrial sewer connection permit, and was superseded by another permit number 01404620, effective March 17, 1987, and expired on March 17, 1991 (PAP-00333481-82). According to the *ECRA Initial Notice General Information Submission*, dated February 18, 1985, the PVSC permit number 01404620-41009-0201 was for Belleville, and PVSC permit number 02404620-41009-0201 was for Bloomfield (PAP-00333200).

According to the June 14, 1985 Final Draft Site Inspection and Hazardous Ranking System Model, the Primary Battery Facility had a local permit (unknown number) for runoff from roofs, non-contact cooling water, air conditioners, drainage, etc. that would drain to PVSC (PAP-00050137).

The 1989 ECRA SES Part 2 identified the EPA Identification number for the site as NJD060779949. A PVSC Permit No. 01404620 was approved on March 17, 1986, with an expiration date of March 17, 1991 (PAP-00049810).

The 2007 PRP DEF clarified that Generator ID NJD060779949 was a Resource Conservation and Recovery Act (RCRA) Generator ID that pertained to disposal of a variety of RCRA wastes documented at the Belleville site manifesting era and included mercury containing wastes (D009), PCBs and lead (D008) (PAS-00027747).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Soil and Groundwater Contamination Investigation Report, dated July 1985 (PAP-00333550)
- Environmental Assessment of the McGraw-Edison Plant, dated November 1985 (PAP-00332948; PAP-00333080)
- Site Evaluation Submission dated August 20, 1986 (PAP-00049203)
- ECRA Sampling Report, dated December 1987 (PAP-00333695)
- Remedial Action Plan, dated March 1989 (PAP-00333795).
- Final Draft, Site Inspection Report and Hazardous Ranking System Model, McGraw Edison, Battery Plant, Bloomfield, New Jersey; prepared for Environmental Services Division, U.S. EPA by NUS Corporation, Superfund Division (PAP-00050130)
- Mobility and Potential Impact of Dissolved Metals in Groundwater, dated March 1992 (PAP-00332589)
- Cleanup Plan Final Progress Report dated March 23, 1992 (PAP-00334161)
- NJDEP Memorandum re ECRA Case # 85260, dated April 1992 (PAP-00334705)
- NJDEP Cleanup Completion letter dated August 13, 1992 (PAP-00334153)
- Final Remedial Investigation Report for the Former Pathmark Grocery Store, dated May 2017 (PAP-00334730).

The Primary Battery Facility was subject to two ECRA actions: (1) ECRA Case # 85260 – Sale of Property, Sale of Business, Transfer of Stock; and (2) ECRA Case # 86528 – Cessation of Operations (PAP-00334149). A third ECRA Case, ECRA Case # 89651, governing the sale of the Primary Battery Facility in 1991, was withdrawn as no contract of sale had been executed and the DEP granted Cleanup Plan approval on June 28, 1991 for the facility based upon other transactions such as cessation of operations (PAP-00334525).

Soil

Primary Battery Facility

Soil investigations in the 1980s found elevated concentrations of mercury, lead, and copper. The highest concentrations of mercury were found in a drainage ditch on the northern edge of the site (4,406 mg/kg mercury) (PAP-00050153, 65, 70). The maximum detected concentration of lead in surface soil was 2,300 ppm, from a sample located at the eastern corner of the main building along the railroad tracks (PAP-00049318-19, 28-29). The highest concentration of copper was found in subsurface soil (1-3 ft bgs) at 80,000 ppm. Elevated concentrations of copper were also noted in the lagoon (up to 43,330 mg/kg) (PAP-00049316-17, 28-29).

As reported in the *Soil Sampling Report* submitted with the 1986 ECRA SES, soil sampling in 1984 detected concentrations of copper greater than 10,000 ppm along the southwestern and northern edge of the main manufacturing building. The highest copper concentration detected in surface soil was 65,000 ppm, from a sample located between the main building and Building No. 57 (see 18 in Area 1 on figure above). The highest concentration of copper in subsurface soil (1-3 ft bgs) was 80,000 ppm (PAP-00049316-17, 28-29). Soil samples collected from the edges of the settling lagoon on August 21, 1984 detected concentrations of copper ranging from 400 to 43,330 mg/kg (PAP-00050153, 65). Soil samples collected from within the pit of the excavated lagoon detected a maximum concentration of 30,000 ppm. Contaminated soil and sludge had been removed from the pit in 1984 (PAP-00049558, 64).

Sewer

There is no information regarding sewer sampling in the available file material.

Remedial Activities

Primary Battery Facility

According to the 1985 Soil and Ground Water Contamination Investigation, Bloomfield Plant, prepared for McGraw-Edison Company by IT Corporation, IT Corporation drilled four soil borings, installed five monitoring wells and nine bore holes (PAP-00049547). Soil sampling results from the composite soil sample B01 showed elevated concentrations of copper, lead and mercury. The soil appeared free of contamination between 6 and 9 ft bgs (PAP-00049569). Contaminated soil and sludge were removed from the pit in 1984, and the eastern half was backfilled with clean fill brought in from off-site (PAP-00049558). The report concluded that the vertical and horizontal extent of soil

contamination beneath the settling pit was unknown; however, the data suggested the vertical extent extended to a depth between 7.5 and 9 ft bgs, and the presence of an oil sheet and petroleum odor in the soils of monitoring well MW3 suggest a spill may have occurred (PAP-00049576).

According to the June 14, 1985 Final Draft Site Inspection and Hazardous Ranking System Model, the Final Draft Site Inspection referenced a clay lined lagoon that had been pumped out and excavated. The lagoon was in the process of being filled and was eventually to become a parking lot (PAP-00050137). NUS Corporation FIT II collected six soil samples on August 21, 1984 from the 1,922-square foot lagoon (PAP-00050160).

According to the November 1985 Final Report, Environmental Assessment of the McGraw-Edison Plan, Fred C. Hart Associates, Inc. installed 21 soil borings (PAP-00049608, PAP-00049616).

The August 1986, Investigation of Former Underground Storage Tank Locations, addressed observations made at the excavation of a former 1,500-gallon kerosene and 500-gallon gasoline underground storage tanks. Soil borings were proposed at both sides and both ends of excavations, as well as a network of shallow wells at the former tank locations. The number of samples and monitoring wells were not identified (PAP-00049227-31).

The 1989 ECRA Site Evaluation Submission stated that all hazardous substance and waste containers had been removed and that all hazardous waste/substance inventory had been removed (PAP-00049813). The evaluation noted a remedial action plan had been designed to stabilize and isolate contaminated areas to prevent off-site migration. The plan recommended limited soil excavation, construction of a slurry wall and surface capping. Limited soil excavation was to include mercury contamination removal from the central portion of the site and slurry wall installation to control groundwater flow off-site. The entire site was to be capped to prevent surface infiltration (PAP-00049821-22).

According to an undated Environmental Assessment of the McGraw-Edison Plant, field activities for the Environmental Assessment ran between April 12 and 24, 1986 to define the spatial distribution of metals at the McGraw-Edison Plant (PAP-00049292) and were conducted by Hardin-Huber Soil Testing Company of Crofton, Maryland who drilled ten soil borings (PAP-00049296). All borings, except T-6, were drilled at ground surface or immediately below the asphalt surface to a depth of approximately 8 feet (PAP-00049296, 98). Sampling results identified several areas of primary concern: 1) the work area between Building No. 57 and the main manufacturing building, 2) the alley along the southwest border of the plant, 3) the southern corner of the plant, 4) the truck and old railroad loading docks and 5) the area north of the main manufacturing building (PAP-00049330).

According to the March 23, 1992, Cleanup Plan Final Progress Report; prepared by SESI, soil excavations were performed in September and October 1991 (PAP-00334181).

An August 13, 1992, letter from NJDEP to Cooper Industries stated cleanup was to be completed in accordance with the Cleanup Plan (PAP-00334153).

Storage Battery Business

Cooper did not remediate the Storage Batter Business property. A Remedial Investigation was completed on behalf of MCB Acquisition Company in 2017 (PAP-00334725).

8. Summary of Asserted Defenses

Cooper asserts the following defenses:

Cooper never owned, operated, occupied or used the Primary Battery Facility. Cooper is the predecessor-by-merger to McGraw-Edison (formerly known as McGraw-Electric Company and referred to herein and in the Preliminary Questionnaire as “McGraw-Edison”), which owned and occupied the Primary Battery Facility between approximately January 2, 1957 and February 7, 1985. Cooper disputes that it has any liability associated with the Primary Battery Facility operations prior to that period, when those operations were owned and operated by Thomas A. Edison, Inc. (“TAE”) or after McGraw- Edison’s ownership/operations of the Primary Battery Facility ended in 1985 (i.e., Battery Products, Inc. operations).

Cooper’s liability, if any, for purposes of the Allocation does not extend to operations associated with the Storage Battery Business. When Cooper merged with McGraw-Edison in 1985, any liabilities that McGraw-Edison may have had with respect to the Storage Battery Business had already been transferred to and assumed by Electric Storage Battery Company (later referred to as Exide Technologies). Any operations in and after 1960 would be the responsibility of Exide, and Cooper has no connection to or liabilities for any such operations.

In addition, regarding the liabilities transferred to Exide, Cooper contends that those liabilities would not include any liabilities related to the operations prior to the 1957 TAE transaction.

COOPER INDUSTRIES, LLC

Facility Name, Address and Size: Cooper Industries, LLC (Cooper Industries), 33 Littleton Avenue aka 400 West Market Street, Newark, New Jersey (PAP-00049893, 98-99; PAP-00049918). The facility encompassed approximately six acres (PAP-00049933). A *Passaic Valley Sewerage Commissioners* (PVSC) *Industrial Wastewater Questionnaire,* dated July 10, 1978, noted the facility had 500 employees working eight hours a day, five days a week (PAS-00000742; PAS-00027682). According to a *PVSC Sewer Connection Application* dated February 6, 1980, 165 employees worked two shifts a day, five days a week (PAP-00332121). By October 1983, the facility employed 77 employees (PAP-00331986).

1. **Business Type:** According to a *New Jersey Department of Environmental Protection (NJDEP) Environmental Cleanup Responsibility Act (ECRA) Application for ECRA Review, Site Evaluation Submission* (the 1985 SES), dated December 19, 1985 the facility manufactured shears and scissors prior to 1980. After 1980, operations were limited to production of forgings that were shipped elsewhere for completion (PAP-00049927, 33).

2. **Time Period of Ownership/Operations**

    Operator: December 1, 1976 – 1985 (PAP-00049933; PAP-00049893; PAS-00027519)
    Owner: December 1, 1976 – April 1988 (PAP-00049893; PAP-00332017, 40-41, 72; PAS-00034511)

    According to a deed dated December 1, 1976, J. Wiss & Sons Co. conveyed the property at Littleton Avenue and Eleventh Avenue in the City of Newark to Cooper Industries, Inc. (PAP-00049893, 98-99). An *Agreement for Acquisition of the Business and Assets of J. Wiss & Sons Co. by Cooper Industries, Inc*. dated November 1976 documented that Cooper Industries would retain the use of the corporate name "J. Wiss & Sons Co." (PAP-00049982, 87). According to the Agreement, Cooper Industries was entitled to Purchased Assets including buildings, facilities, machinery, equipment, tools, patterns patents, trademarks, copyrights, copyright registrations, etc. (PAP-00049997-98, 50006). J. Wiss & Sons agreed to indemnify, hold harmless and defend Cooper Industries from any loss, liability, cost, expense or claim arising from or incurred in connection with any misrepresentation, breach of warranty or non-fulfillment or non-performance of any agreement (PAP-00050046). The document titled *Cooper Industries, Inc. Purchase of Assets of J. Wiss & Sons Co.* included an Agreement of Assumption of Liabilities of Wiss by Cooper Industries (PAP-00331539). The Agreement dated December 8, 1976 between Cooper Industries, Inc. and J. Wiss & Sons Co. stated that Cooper Industries agreed to assume and in due course to pay and discharge the liabilities and obligations described in Section 1.2 of the Agreement; the liabilities and obligations which were not assumed included, but were not limited to: (b) liabilities, if any, not related to or which did not arise from the normal continuing operations of Seller (PAP-00331894-96).

During the Cooper Industries' operating period at the site, Cooper Industries owned a portion of the facility and leased the remainder from Sixth Street Urban Renewal Corporation (SSURC) (PAP-00049893, 98-99; PAP-00332013). The *Certificates of Occupancy* for the facility issued at the beginning of the Cooper Industries' operating period identified J. Wiss & Sons as the owner of 13-45 Littleton Avenue, which was used for forging, grinding, and assembly of sheers and scissors (PAP-331987). SSURC was identified as the owner of 29-35 11th Avenue (PAP-00331991-92), 392-414 West Market Street (PAP-00331989-90) and 472-474 Central Avenue, on which the parking areas and an office building were located (PAP-00331995-96), and of 13-15 Littleton Avenue, which was used for offices and forging and annealing of sheers and scissors (PAP-00331993-94). The parcels owned by Cooper Industries and those owned by SSURC were sold in April 1988 (PAP-00332072).

According to the May 28, 2010 letter from Christopher Marraro on behalf of Cooper Industries to the EPA, operations at the site ceased in August 1983. However, according to Cooper Industries' New Jersey National Pollutant Discharge Elimination System (NJPDES) application, Cooper Industries ceased operations at the facility in 1985 (PAS-00027519). In addition, Cooper Industries transferred the Littleton Plant property on April 12, 1988 to Newark Venture, Inc., which subsequently transferred the property to Victory Temple National Holiness Church, Inc. (PAS-00034509, 11).

3. Operational History/COC Use and Presence at the Facility

According to the 1985 SES, the facility was a complete shear and scissor manufacturing operation prior to 1980. After 1980, operations were limited to production of the forgings which were shipped elsewhere for completion (PAP-00049933). [Note: Cooper Industries acquired ownership interest in the property and operations for the Littleton Avenue site in 1976 (PAP-00049893; PAP-00049982).]

According to the 1985 SES, manufacturing began in the tool rooms on the second floor of Buildings 8, 9 and 15 where ancillary and forging tools were made and repaired. Graphite electrodes were machined into molds for shears and scissors using an electric discharge machining procedure. Dust was collected in a baghouse dust collector on the roof of Building 8 (PAP-00049927, 33).

The 1985 SES stated that forging tools were set in large drop hammers in Building 4. Each drop hammer had an oil-fired slot furnace that heated a steel bar stock raw material to a forging temperature of 2,200 degrees Fahrenheit. Steel bar raw stock was received in Building 14 and cut to lengths for forging in Building 11. No. 2 fuel oil heated the slot furnaces and the buildings in the winter. Four underground storage tanks existed at this facility in which No. 2 fuel oil was stored (PAP-00049933-34, 36).

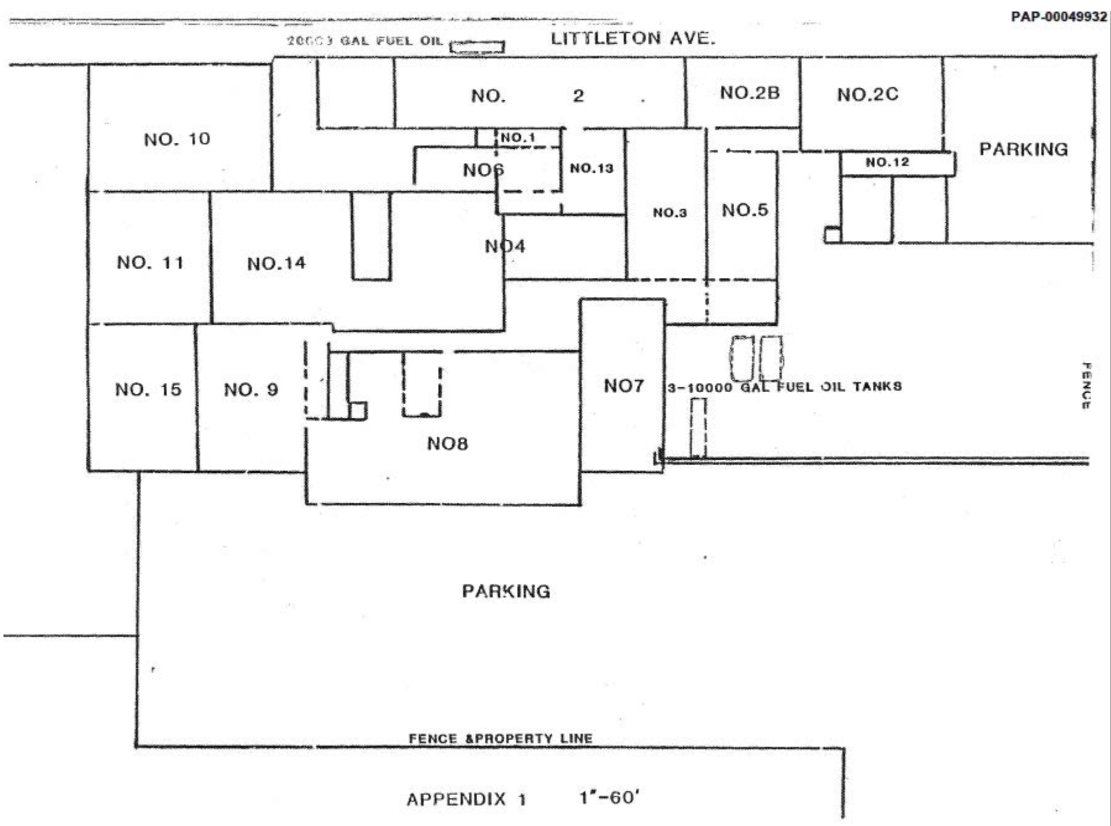
Forgings produced in Building 4 were annealed in a furnace in Building 10. Water passed through the plant one time to cool the furnaces and air compressors. Influent and effluent water samples were collected bimonthly beginning in 1981 (PAP-00049934). Eldib Engineering and Research, Inc. collected discharge monitoring samples and sent quarterly Individual Discharge Monitoring Reports to the PVSC (PAP-00049937-38). [Note: The monitoring reports contained within the 1985 SES were not

copied completely, resulting in missing parameter names (PAP-00049939-81).] Scale was removed from forgings by a Wheelabrator machine in Building 11, and dust generated by this machine and all grinding processes at the plant was periodically picked up by a scrap contractor. The descaled forgings passed on to press rooms in Building 9 and 15 where Trim, Punch and Coin operations occurred. In the coining area, large knucklepress machines were kept well lubricated. Oil would run into a containment area composed of approximately 18 inches of thick impervious concrete and was then pumped into 55-gallon drums that were removed by a contractor (PAP-00049934).

The list of assets purchased by Cooper in the 176 Acquisition Agreement did not include any pickling equipment (PAP-00331785-93).

The PVSC *Industrial Wastewater Questionnaire* for the facility, which was contained within Appendix A, Industrial Waste Surveys, to the *Heavy Metals Source Determination Study, Phase I,* prepared by Elson T. Killam Associates, Inc., dated August 15, 1978, stated the principle raw materials used at the facility were nickel and steel (PAS-00000742).

The following figure from the *NJDEP ECRA Initial Notice General Information Submission*, dated December 19, 1985 provides a site map for the facility showing building locations and the locations of the fuel oil tanks:



(PAP-00049932)

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

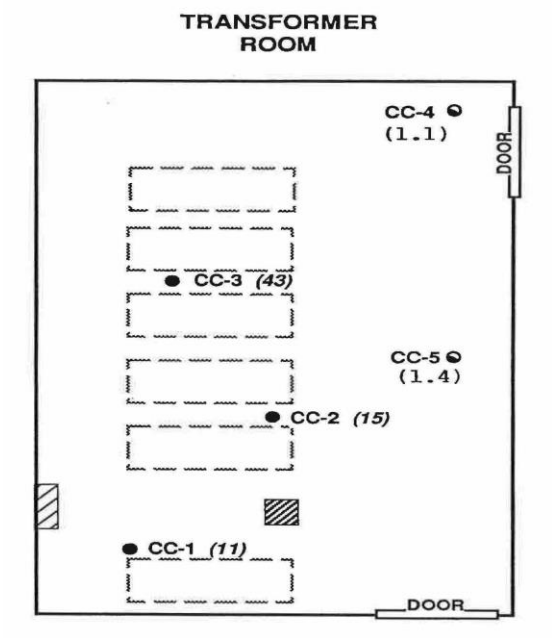
PCBs

According to an undated *Electrical Transformer Decommissioning Report, Former Cooper-Wiss Facility* (Decommissioning Report), there were six 200 kilovolt electrical transformers in a small room in the facility. The report stated that in June 1991, the oil from the transformers was sampled and it was determined that the transformers were non-PCB class since the oil contained under 50 parts per million (ppm) of PCBs. The report stated that this was consistent with Wiss having the transformers retro-filled at least twice before 1985. The report stated that two wipe samples collected from stained areas on the concrete floor near the transformers inside the building contained PCB levels of 58 and 119 ppm. The report stated that "it is presumed that the elevated PCB levels resulted from historical spills from the transformers prior to retrofilling" (PAS-00027729).

As described in the Decommissioning Report, in October 1991, Cooper Industries contracted Direct Environmental, Inc. to drain and decommission the transformers and remediate the oil stained areas. After the transformers were removed and disposed off-site, the oil stained areas in the concrete floor were cleaned and scarified to a depth of 1/16 of an inch, and it was reported that no holes or deep cracks were noted in the concrete. Three concrete chip samples were collected to confirm removal of PCBs. Analytical results stated that slightly elevated levels of PCBs, namely Aroclor-1254, were still present in the concrete. PCB concentrations ranged from 11 ppm to 43 ppm. On November 15, 1991, Direct Environmental returned to the site and scarified an additional one-eighth of an inch from the concrete floor (PAS-00027729-30; PAP-00332169-70). Scarification solids were drummed and second round of confirmatory samples were collected (PAP-00332170; PAS-00027565, 729-30). The November 15, 1991 samples reported concentrations of Aroclor-1254 ranging from 0.082 to 1.4 ppm, which are below NJDEPE's preliminary draft cleanup standards of 2 ppm (PAP-00332172, 89, 93-94).

According to the Final Remedial Investigation Report, 20,000-Gallon No. 6 Heating Oil Underground Storage Tank Area of Concern, dated March 31, 2014, for the facility, no cracks in the concrete beneath the transformers or other conduits to the subsurface were identified. In 1992, a closure report was issued by Cooper Industries and no further action was recommended (PAP-00332283).

The following figure from the January 15, 1992 *Cooper-Wiss Facility Quarterly Progress Report*, shows the PCB sampling locations with detected concentrations in parentheses:



(PAP-00332171)

PAHs

The PAHs naphthalene and 2-methylnaphthalene were detected in subsurface soil samples associated with a former 20,000-gallon fuel oil UST and a former 5,000-gallon fuel oil UST, respectively (PAP-00332283-84). Data for additional PAH analytes were not available in the references.

Metals - Copper, Lead and Mercury

According to the *Heavy Metals Source Determination Study, Phase II*, dated April 1980, J. Wiss & Sons, Inc., 400 West Market St., was listed as having a process wastewater flow rate of 0.1320 million gallons per day (mgd) from its forging and fabricating operations, resulting in contributions of copper at 0.260 pounds (lbs) per day (0.236 milligrams/Liter [mg/L]); lead at 2.818 lbs per day (2.560 mg/L); and mercury at 0.0003 lbs per day (0.000 mg/L) (PAS-00027508, 681).

According to the Industrial Wastewater Questionnaire provided in the *Heavy Metals Source Determination Study, Phase I*, dated August 15, 1978, there were three metal contributing discharge points to the municipal sewer (PAS-00000744). Previous measurements were reported for Sampling Point A only, including a daily flow of 132,000 gallons per day (gal/day) with a lead concentration of 3.75 mg/L, and no results for copper or mercury (PAS-00000753). Sampling Point A appears to be a manhole where samples were collected to represent discharge to the municipal sewer (PAS-00000746-7).

According to a February 6, 1980 PVSC Sewer Connection Application, the facility's water usage in 17 was 44,256,916 gallons (PAP-00332122). Effluent samples collected from three outlets collected on January 16-17, 1980 reported concentrations of 0.236 mg/L for copper, 2.56 mg/L for lead, and 0.000 mg/L for mercury (PAP-00332125-26). The application stated that "metal forging" operations were being conducted at the time the samples were collected (PAP-00332126). The 24 Hour Sample Analysis for Outlet 1 (boiler outfall) reported lead at 0.284 mg/L, mercury at 0.045 mg/L and a pH level of 9.2 (PAP-00332127-28). The 24 Hour Sample Analysis for Outlet 2 (tumbler outfall) reported lead at 0.482 mg/L, mercury at 0.116 mg/L and a pH level of 12.7 (PAP-00332129-30). The 24 Hour Sample Analysis for Outlet 3 (parking lot manhole) reported lead at 0.457 mg/L, mercury at 0.037 mg/L and a pH level of 7.2 (PAP-00332131-2). Copper results were not reported for the 24 hour samples.

Samples were also collected and reported in a June 3, 1981 PVSC Sewer Connection Application. Outlet No. 2 was identified as the tumbler room; no OU2 COCs were sampled for. A composite sample from Outlet No. 3 (boiler room) was reported to have a concentration of lead at less than 0.42 mg/L, and less than 0.0007 mg/L mercury; no concentration was reported for copper (PAP-00402652).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] NJDEP, *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a *Final Remedial Investigation Report, 20,000-Gallon No. 6 Heating Oil Underground Storage Tank Area of Concern*, dated March 31, 2014, prepared on behalf of Cooper Industries, during the installation of five borings/temporary wells, apparent fill was observed to depths up to approximately 10 feet below ground surface (bgs). Observed fill materials included orange fine sand, brick and mortar fragments, concrete fragments, and ash. Some of this fill was removed by Public Service Electric & Gas (PSE&G) during site demolition work. The area of the site where fill was observed appeared to have first been developed with residences and offices sometime between 1900 and 1925. By the late 1960s, this area of the site was redeveloped with an addition to the main site building. It was stated that fill materials may have been utilized during one, or both, of these development periods (PAP-00332230-31). Historic fill was confirmed in 2013 at the site during PSE&G site redevelopment activities at depths of approximately 0 to 10 feet below ground surface (PAP-00332242). However, no analytical data were available for soil concentrations of copper, lead, mercury, and PAHs associated with Historic Fill at the site. [Note: Although this report is outside the ownership and operational timeframe of Cooper Industries, the initial investigation of this site began during the timeframe of ownership.]

5. COC Pathways

Combined Sewer System

Correspondence predating Cooper Industries' operation at the site (dated April 11, 1975 from J. Wiss & Sons Co. to the PVSC transmitted Waste Effluent Surveys) states there were for four discharge points to the PVSC from the Newark facility. The letter stated the information was the same as supplied to PVSC for 1972, since the effluent discharge characteristics had not significantly changed since that time, except for volume (PAP-00332144).

According to the *Report upon Overflow Analysis to Passaic Valley Sewerage Commissioners for the Clay Street CSO District*, prepared by Elson T. Killam Associates, Inc. in 1976, the site was located within the Clay Street CSO District. The outfall was located on the westerly side of the intersection of Clay Street and McCarter Highway. During wet weather events, when the volume of combined sanitary and storm water flow was too much for the sewer, both sanitary and storm water bypassed to the Passaic River. Under normal dry weather flow conditions, the flow was diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow entered the interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River through six tide gates (PAS-00027640).

According to a 1977 Semi-Annual Report prepared by PVSC, PVSC identified Wiss as one of the "major contributing industries" with 50,000 gallons per day or more to the PVSC CSO system (PAS-00027647, 50).

According to the PVSC *Industrial Wastewater Questionnaire,* dated July 10, 1978, J. Wiss & Sons, Inc. obtained 4,899,400 gallons of water per quarter from the city or public water supply and 3,627,800 gallons of water per quarter from a private well supply. Of the water used at the site, less than 5% of the water was consumed in actual process. 45.5% of water was discharged from process; 42.5% of water was discharged as non-contact cooling water; and 7% of water was discharged from sanitary conveniences (PAS-00000743).

According to a February 6, 1980 PVSC Sewer Connection Application, there were three 3-inch outlets connected to the sewer. All three were reported to contain industrial waste. Outlet 1 had a reported daily flow of 5,000 gallons; Outlet 2 had a reported daily flow of 1,300 gallons; and Outlet 3 had a reported daily flow of 177,027 gallons (PAP-00332124). It is noted that a subsequent letter from the facility to PVSC, dated April 24, 1981, stated that only two of the three outlets contain industrial waste: 1) the outlet from the Tumbling Room; and, 2) the outlet from the Boiler Room, and that the third outlet ran to the manhole in the parking lot and carried only sanitary waste from the office buildings (PAP-00402655).

According to correspondence from the facility to the PVSC, dated February 25, 1980, the facility had collected samples from the sewage outlets upon completion of phase down activities at the 33 Littleton Avenue site. It was stated that during the third quarter of 1979, the complete nickel plating operation, 25% of the parts washing facility, 20% of the tumbling facility and 40% of the wet grinding facility were removed from plant. During the fourth quarter, 75% of the parts washing facility, 50% of the tumbling facility and 60% of the wet grinding facility were removed from the plant. These removals materially affected the volume and constituents of their sewage outfall (PAP-00331985). Note: The sample results were not included, and the change in volume was not specified.

According to results of samples collected in early May and June 1981 and attached to a June 3, 1981 PVSC Sewer Connection Application: a) effluent from outlet #1 had a pH level of 10.8; b) effluent from outlet #3 (from the boiler room) had pH levels of 6.7 and 7.6 (on June 4, 1981); and c) effluent from outlet #2 (the tumbler room) had a pH level of 12.3 (PAP-00402650-4).

According to a letter from Cooper to PVSC in 1982, the facility had reduced water usage because of plant shutdowns for vacation and “lack of business in this state of economy” (PAP-00332142).

According to a letter from a facility plant engineer to PVSC in 1983, the facility had decreased water usage and effluent output because: 1) the facility “had a reduction of just over 50 percent in personnel over the past year”; and 2) the facility changed its work process to use less water (from 200 gals. of water per batch to 50 gals.) (PAP-00332143).

A letter from Wiss to the PVSC, dated August 29, 1983 stated that the tumbling operation was terminated, and starting August 31, 1983, all residuals would be eliminated from this operation's discharge point, and only potable effluent would be discharged (PAP-00480643)[5]. According to a PVSC Industrial Monitoring Work Order, on August 29, 1983 the facility ceased industrial operations that "might have required pre-treatment" and the facility only had "domestic and cooling water waste" (PAP-00331986).

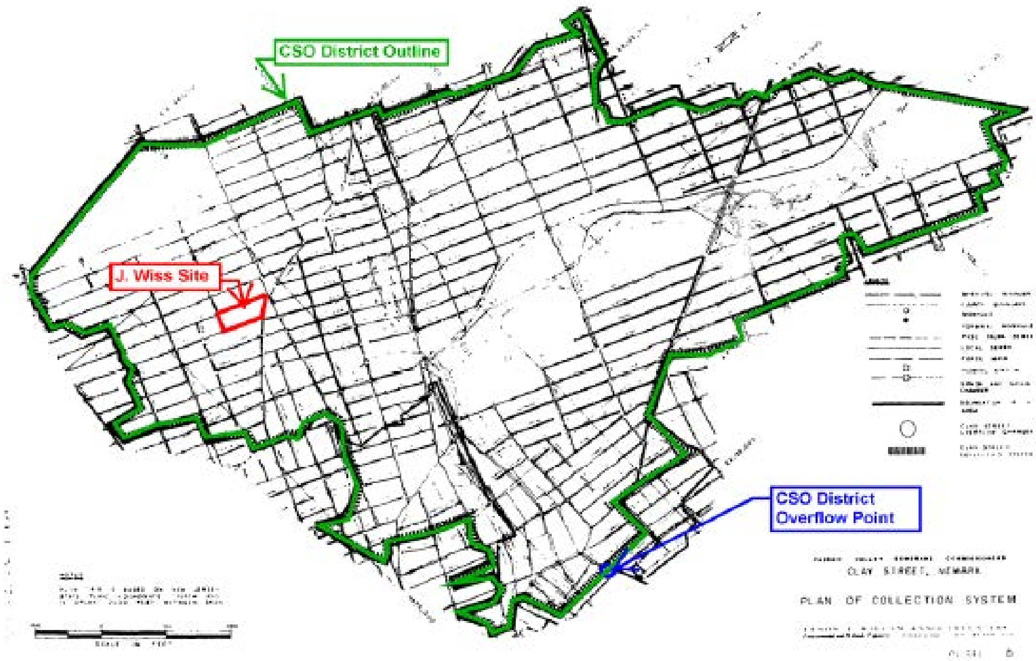
According to the *Cleanup Plan Progress Report; Reporting Period: 4/92 – 6/92, Former Cooper-Wiss Facility*, dated July 15, 1992, a product recovery system was installed in May 1991 to address groundwater contamination and ran nearly continuously during June 1992. Between June and July, a total of 24,710 gallons were treated and discharged to the sanitary sewer. This equated to a monthly average of 0.64 gallons per minute (gpm). During the latter part of June the average flow rate was 0.93 gpm (PAS-00027572-73).

According to the 1985 SES, forgings produced in Building 4 were annealed in a furnace in Building 10. A stream of water making one pass through the plant was used to cool both this furnace and the air compressors. This stream was monitored by analysis of composite influent and effluent samples performed bi-monthly since 1981 (PAP-00049934). Note: Results of the sampling were not provided. It was also not reported to where this effluent discharged. However, the 1985 SES stated that the facility conducted nickel-plating prior to 1979, and wastewater flowed directly to the sewer system (PAP-00049935).

According to a letter from Christopher Marraro on behalf of Cooper Industries to the EPA, dated May 28, 2010, the plating room had an intermittent flow while the boiler room with non-contact cooling water had a continuous flow. Outlet A received effluent from plating operations, and Outlet B received boiler room discharge. The configuration of the discharge mechanism from the plating operation was a float operated sump pump with a very small diameter influent and effluent. Operation of the pump was intermittent because the sump had to fill before the float activated the pump to discharge to the sewer (PAS-00034513).

The following figure from the 2009 Data Extraction Form shows the approximate location of the Littleton Avenue facility within the Clay Street Combined Sewer Overflow District:

[5] This Report was revised to include documents received on May 23, 2020. The additional documents did not change Cooper Industries' previous certification.



(PAS-00027487)

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

Permit Summary					
Permit #	**Issued by:**	**Use**	**Dates**	**Discharge Limits**	**Citation**
20400752	PVSC	Discharge to sewer	July 2, 1981 to July 2, 1986	Not listed	PAP-00049921, 25
620	NJDEP	Approved Physical Connection	April 1, 1985 to March 31, 1986	Not listed	PAP-00049921, 26

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- 1985 SES
- Preliminary Assessment Report, dated December 23, 1985
- Cleanup Plan Progress Report; Reporting Period: 4/92 – 6/92, Former Cooper-Wiss Facility, prepared July 15, 1992 (PAS-00027568)
- January 1992 Quarterly Progress Report, Cooper/Wiss Facility, Newark, New Jersey, ECRA Case No. 85810, dated January 15, 1992, by Ground Water Associates, Inc. (PAP-00332164).
- Remedial Investigation / Remedial Action Work Plan, dated November 25, 2003
- Site Investigation Report, dated August 8, 2004
- Receptor Evaluation, dated March 21, 2014
- Case Inventory Document, dated March 21, 2014 (PAP-00332199).
- Final Remedial Investigation Report, 20,000-Gallon No. 6 Heating Oil Underground Storage Tank Area of Concern, dated March 31, 2014, prepared by Paulus, Sokolowski & Sartor (PS&S) (PAP-00332474)
- Remedial Action Work Plan, dated February 6, 2019 (PAP-00421386)
- Remedial Action Work Plan, dated June 2019 (PAP-00421392)
- Remedial Action Report, dated October 2, 2019 (PAP-00406870).

Soil

According to a *New Jersey Pollutant Discharge Elimination System, Discharge to Ground Water Permit Application, Cooper-Wiss Site*, dated May 1990, Cooper Industries retained Geraghty & Miller, Inc. in October 1986 to define soil quality conditions near an underground fuel tank (Tank No. 1) to determine if this tank had leaked fuel oil to the subsurface environment. The tank stored No. 6 fuel oil until 1978, after which it stored No. 2 heating oil. Petroleum hydrocarbons were detected in six of seven soil borings. In August 1987, the tank and 1,200 cubic yards of soil were removed, and the excavation was backfilled. Geraghty & Miller, Inc. installed a test well in the center of the excavation to determine the thickness of floating product in the subsurface and submitted a sampling and cleanup plan in November 1987. The plan was approved, and free product removal began in 1987 (PAS-00027580). Note: Analytical results were not attached.

Correspondence dated June 23, 1994 from NJDEP to Cooper Industries stated that NJDEP had reviewed the November 15, 1993 report from Cooper Industries documenting the remedial investigation and remedial action undertaken in response to the discharge from Cooper Industries' underground storage tank system. Based on a review of the information submitted, no further action would be required at that time (PAP-00332527). Note: The November 15, 1993 report was not provided.

On June 2, 2014, PS&S reported the results of sampling conducted at the facility in April 2014. This sampling was performed to screen and assess the subsurface soils for the presence of free-product to assist in defining the limits of the petroleum impacted soil. The collected samples were analyzed for extractable petroleum hydrocarbons, naphthalene, and 2-methylnaphthalene. 2-Methylnaphthalene was reported up to 152 mg/kg, and naphthalene was reported up to 34.2 mg/kg. See below for further discussion of the results (PAP-00332474-75).

Sewer

There is no information regarding sewer sampling in the available file material.

Remedial Activities

According to an undated *Electrical Transformer Decommissioning Report, Former Cooper-Wiss Facility* (Decommissioning Report), analysis of two wipe samples collected from stained areas on the concrete floor in the facility contained 58 and 119 ppm PCBs. The detected PCBs were assumed to have resulted from historical spills (PAS-00027729). As described in the Decommissioning Report and a Quarterly Progress Report from January 1992, Direct Environmental scarified the concrete floor to remove the contaminated concrete in 1991. Scarification solids were drummed and confirmatory samples reported concentrations of Aroclor-1254 ranging from 0.082 to 1.4 ppm (PAP-00332170, 72, 89, 93-94; PAS-00027565, 729-30).

According to the *Cleanup Plan Progress Report; Reporting Period: 4/92 – 6/92, Former Cooper-Wiss Facility*, dated July 15, 1992 (1992 *Cleanup Plan Progress Report*) by Ground Water Associates, Inc. for New Jersey Department of Environmental Protection and Energy (NJDEPE), the transformer area cleanup was completed at that time and no further actions were proposed (PAS-00027572).

The 1992 *Cleanup Plan Progress Report* reported that a groundwater product recovery system ran nearly continuously during June. Between June and July, a total of 24,710 gallons were treated and discharged to the sanitary sewer. This equated to a monthly average of 0.64 gpm. During the latter part of June the average flow rate was 0.93 gpm. (PAS-00027572, 75).

On June 2, 2014, PS&S reported the results of sampling conducted at the 33 Littleton Avenue site in April 2014. This sampling was performed to screen and assess the subsurface soils for the presence of free-product to assist in defining the limits of the petroleum impacted soil. The collected samples were analyzed for extractable petroleum hydrocarbons, naphthalene, and 2-methylnaphthalene. Extractable petroleum hydrocarbons were detected in several samples. 2-Methylnaphthalene was reported in PDB-03, PDB-05, PDB-09, PDB-09B, and PDB-18 at concentrations of 34.3 milligram/kilogram (mg/kg), 12.4D mg/kg, 22.1D mg/kg, 152D mg/kg, and 16.5D mg/kg respectively, exceeding the Impact to Groundwater Soil Screening Level of 8 mg/kg. The remainder of the 2-Methylnaphthalene concentrations ranged from Not Detected (ND) to 7.65 mg/kg. Naphthalene was present in PDB-03, PDB-04, PDB-09, and PDB-09B at concentrations of 14.3D mg/kg, 10.2D mg/kg, 7.01 mg/kg, and 34.2 mg/kg

respectively, exceeding the NJDEP Residential Direct Contact Soil Remediation Standard of 6 mg/kg. PDB-09B also exceeded the Non-Residential Direct Contact Soil Remediation Standard of 17 mg/kg and the Impact to Groundwater Soil Screening Level of 25 mg/kg. The remainder of the naphthalene concentrations ranged from Not Detected (ND) to 5.98 mg/kg (PAP-00332474-75). [Note: Although this sampling occurred after the timeframe that Cooper Industries operated the 33 Littleton Avenue site, this information is included here to document the effects of petroleum released at the facility.]

The sampling locations for the 2014 sampling are shown on the diagram below:

(PAP-00332476)

8. Summary of Asserted Defenses

Cooper asserts the following defenses:

- Any potential liability Respondent may have is limited to the period from December 1, 1976 to about 1985 (the Cooper Operating Period). Cooper did not assume and does not have any liability for any discharges or releases during the time that Wiss Co. owned/operated the facility (May 1900 to December 1, 1976) or any alleged predecessors of Wiss Co. owned/operated the facility (including the Wiss family members, between 1887 and May 1900, or the National Shears Company, between 1898 and 1900). As part of the 1976 transaction with Wiss Co., Cooper assumed certain liabilities, but the scope of those liabilities was narrowly and specifically prescribed and did not include any CERCLA liabilities associated with historical discharges by the facility.

- During the Cooper Operating Period, any discharges from the facility (including any COC in that discharge which may have reached the Passaic River, whether through the Clay Street CSO or otherwise), were "federally permitted releases" and cannot be the basis for imposing CERCLA liability on Cooper.

COVANTA ESSEX COMPANY

Facility Name, Address and Size: Essex County Resource Recovery Facility (ECRRF); 183 Raymond Boulevard and 66 Blanchard Street, Newark, New Jersey; 25 acres (PAP-00065320); Information on number of employees and shifts was not available in the file material.

1. **Business Type:** Municipal solid waste processor/incinerator and electricity generator (PAP-00065232).

2. **Time Period of Ownership/Operations**

Operator: 1990 to present
Owner: Port Authority (land only) 1978 to present

1978: The site was vacant prior to 1978 when it was purchased by the City of Newark Redevelopment and Housing Authority (PAS-00049003).

1983: In 1983, the Port Authority selected Browning-Ferris Industries, Inc. to design, construct, and operate the ECRRF (PAS-00049004).

1984: In 1984, BFI Energy Systems of Essex County, Inc. (an affiliate of Browning-Ferris Industries, Inc.) and Air Products Ref-Fuel of Essex County, Inc. created American Ref-Fuel Company of Essex County (ARF), which subsequently assumed responsibility for constructing and operating the ECRRF (PAS-00049004). On October 31, 1984, the New Jersey Department of Environmental Protection (NJDEP) issued a directive requiring the Newark Redevelopment and Housing Authority to clean up the property (PAS-00049005).

1985: On January 11, 1985, the Newark Redevelopment and Housing Authority and NJDEP entered into an Administrative Consent Order for Newark Redevelopment and Housing Authority to complete the investigation and remediation of the property. For the next two years, the Newark Redevelopment and Housing Authority conducted “significant” surface removal, soil excavation, and re-grading (PAS-00049005).

1987: On September 11, 1987, the Port Authority agreed to take responsibility for the remaining investigation and remediation of pre-existing environmental impacts at the property. The Port Authority executed a Memorandum of Understanding with NJDEP that required a two-phase remediation of certain portions of the property. The City of Newark Redevelopment and Housing Authority sold the property on which the ECRRF was to be located to the Port Authority in December 1987. From 1987 until 1989, the Port Authority remediated additional areas of the property either by soil excavation or capping (PAS-00049004-05).

1988: The Port Authority leased the property to ARF effective on or about January 31, 1988. ARF, pursuant to its contract with the Port Authority, completed certain elements of the remediation in conjunction with facility construction required by the Memorandum of Understanding (PAS-00049004-05).

1989: On September 29, 1989, NJDEP determined that no further investigation or remediation was required (PAS-00049005).

1990: ARF began construction of the facility in February 1990. ECRRF operations began in November 1990 (PAS-00049004).

2005: On June 24, 2005, Covanta Holding Corporation acquired ARF and, thereafter, changed the name of the company to Covanta Essex Company (PAS-00049004).

The Port Authority currently owns the real property upon which the ECRRF is located and Covanta owns the facility (PAS-00048509).

3. Operational History/COC Use and Presence at the Facility

ARF began construction of the facility in February 1990. Operations began on November 3, 1990 (PAS-00049004). The ECRRF is a large-scale water wall incinerator that produces high temperature, high pressure steam from the incineration of solid waste (PAP-00065557). The ECRRF was created as a joint effort between the City of Newark, the County of Essex, and the Port Authority to support the Essex County Utility Authority's Solid Waste Management Plan. The ECRRF processes 2,800 tons per day of municipal solid waste and generates approximately 500 million kilowatts of electricity each year (PAS-00049002-03).

Municipal solid waste is incinerated in one of three municipal solid waste combustors, and the steam from the boilers is used to drive two 35-megawatt turbines (PAP-00065231). The facility includes an air pollution control system, which consists of a carbon injection system for the control of mercury emissions, among other chemicals (PAP-00065558).

According to a New Jersey Pollutant Discharge Elimination System (NJPDES) permit application addendum prepared by ARF, dated April 8, 1991, onsite hazardous materials storage included a phosphoric acid tank, three lime silos, a protected ash tarping station, and an ammonium hydroxide tank located within an area served by two inlets, which lead to one of two outfalls at the site (outfall DSN001). An underground fuel oil storage tank and a sulfuric acid tank were located within the drainage service area of the second outfall (DSN002). In addition, a fill port for a sodium hydroxide tank, housed inside a building, was also located in close proximity to this storage area (PAS-00049039). The letter also states that ash handling functions (i.e., collection and conveying of ash streams (including fly and bottom ash), ash treatment, ferrous recovery, ash storage, and loading of trailers) were located inside buildings or enclosures. Trailers loaded with ash and ferrous product recovered from the ash were pulled outside of the building, and truck tarping occurred within a protected area called “the ash tarping station” prior to transport (PAS00049039-40).

4. Identified COCs

It is noted that prior to 1978, the property was vacant and subject to illegal dumping (PAP-00065320; PAS-00049004). According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, pre-existing contamination was identified at the property in 1982, prior to construction of the facility (in 1988) and operation of the ECRRF, which began in 1990 (PAS-00049004). Reportedly, abandoned vehicles, hundreds of 55-gallon drums, and two tanker trailers of waste were identified on the property. The letter also reports that the property was remediated by the Port Authority (owner) via soil removal or capping. Polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury, copper, lead, dichlorodiphenyldichloroethane (4,4'-DDD) and dichlorodiphenyltrichloroethane (4,4'-DDT) were detected in site soil prior to construction of the ECRRF (PAP-00195088-89; PAP-00195120-21; PAP-00065321-24). According to the letter, on September 29, 1989, NJDEP determined that no further investigation or remediation was required at the property, provided that ARF seeded, paved, or otherwise covered certain areas of the property to preclude the generation of dust (PAS-00049005).

PCBs

No PCB data, storage or use information was identified in the available file material for the time period after operation of the ECRRF began in 1990.

Dioxins/Furans

No dioxin / furan data, storage or use information were identified in the available file material for the time period after operation of the ECRRF began in 1990.

PAHs

No PAH data, storage or use information were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified low and high molecular weight PAHs in the two samples analyzed for PAHs (PAP-00195136). It is unclear what operations or potential sources of contamination these detections may be associated with based on review of the referenced document.

DDx

No DDx data, storage or use information were identified in the available file material for the time period after operation of the ECRRF began in 1990.

Mercury

The facility includes an air pollution control system, which consists of a carbon injection system for the control of mercury emissions, among other chemicals (PAP-00065558). No mercury data since operation of the ECRRF began were identified in the available file material, nor was any information identified regarding the disposal of mercury captured by the air pollution control system.

No mercury data were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified mercury in all samples collected. The maximum concentration detected was 1.6 milligrams per kilogram (mg/kg) (PAP-00195134). It is unclear what operations or potential sources of contamination these detections may be associated with based on review of the referenced document.

Copper

No copper data were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified copper in all samples collected. The maximum concentration detected was 130 mg/kg (PAP-00195134).

The NJPDES permit (No. 0055247) was initially issued on February 1, 1986, as applicable to the construction phase of the ECRRF (PAS-00049020).

Lead

No lead data for soil were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified lead in all samples collected. The maximum concentration detected was 5,880 mg/kg (PAP-00195134). It is unclear what operations or potential sources of contamination these detections may be associated with based on review of the referenced document.

According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, lead was detected at “low levels” during six different stormwater ditch sampling events at the property prior to 1994; the concentrations were not listed in the referenced document (PAS-00049006). However, concentrations of lead in facility discharges were identified in the available file material as follows:

- According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, “low levels” of lead were detected in the site stormwater outfalls between 1988 and 1992. In addition, sampling of the stormwater ditches after 1992 identified “low levels” of lead (PAS-00049005-06). According to a table appended to a *Technical Evaluation*, prepared for legal counsel for Covanta, dated August 26, 2016, lead was detected in facility stormwater on four occasions between 1991 and 1993. Lead concentrations detected at outfall DSN001 ranged from 169 micrograms per liter (µg/L) to 260 µg/L; concentrations detected at outfall DSN002 ranged from 196 µg/L to 295 µg/L (PAS-00049054).
- According to a letter prepared by NJDEP, dated June 8, 1994, lead was detected in facility effluent at a concentration of 204 µg/L on November 31, 1993 (PAS-00106082).

According to a letter prepared by Apex Companies, LLC for legal counsel for Covanta, dated January 20, 2017, and a letter prepared by legal counsel for Covanta, dated January 20, 2017, a western ditch forms the boundary between the Covanta site and an

adjacent Norpak property (formerly Eagle Picher Lead Company). Eagle Picher Lead Company operated a lead pulverizing and processing facility immediately west of and adjacent to the Covanta site from at least 1931 until 1956 (PAS-00048577; PAS-00048510). In 1993, sampling at the Norpak facility identified lead concentrations in soil as high as 20,000 ppm, and as high as 915 ppm in the western ditch (PAS-00048525, 52). The letters state that a review of NJDEP files regarding the Covanta site and adjoining properties shows that the Norkpak site is the likely source of the six lead exceedances detected in stormwater discharged to the western ditch between July 1989 and August 1993 (PAS-00048577; PAS-00048510). Reportedly, stormwater from the Norpak property may have drained on to the Covanta property before the western ditch was constructed sometime between 1966 and 1982 (PAP-00065487; PAS-00048510). After the western ditch was constructed, Covanta reports that Norpak site runoff has drained into the western ditch on the site where Covanta's historical NJPDES sampling outfalls were located when the lead exceedances occurred (PAS-00048510). A *Site Inspection Report* for the Norpak site, dated July 2005, also states that runoff from the Norpak facility discharges to the western ditch (PAS-00048553).

The letter prepared by Apex Companies, LLC for legal counsel for Covanta, dated January 20, 2017, also notes that lead has been found on the adjacent Otillio Landfill property which is upgradient from the site (PAS-00048509). In addition, according to a letter prepared by legal counsel for Covanta, dated August 26, 2016, the stormwater ditches on the property are "known to be affected" by drainage from upgradient sources contaminated with lead, including the Ottilio landfill (PAS-00049006).

A figure depicting the location of the site relative to surrounding properties and site drainage features is provided below (PAS-00049026):

In addition, the letter prepared by legal counsel for Covanta, dated August 26, 2016, notes that lead was detected in site soils before operation of the ECRRF. It goes on to state that the western ditch receives infiltration of off-site groundwater and backflow from the Passaic River during high tide events, both of which are known to be contaminated (PAS-00049006; PAS-00048509, 54).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 contaminants of concern (COCs): PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to an *Essex Country Resource Recovery Project, Mitigating Measures Program* document, dated October 1984, and an undated *Final Report, Risk Assessment for Blanchard Street Site*, prior to development, the parcel was tidal marshland. At some time prior to the construction of the ECRRF, the site was covered with a layer of fill material, which included rubble, sand, gravel, and demolition debris, and ranged in thickness from four to 10 feet. The fill was disturbed during construction of the ECRRF (PAP-00195073).

It is noted that no soil data were identified in the available file material for the time period after operation of the ECRRF began in 1990; however, surface soil data was collected by ARF in August 1988 (prior to construction of the ECRRF).

The maximum levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00195134, 36).

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	5,880 mg/kg
Copper	130 mg/kg
Mercury	1.6 mg/kg
Benzo(a)anthracene	0.64 mg/kg
Benzo(a)pyrene	0.56 mg/kg
Benzo(b)fluoranthene	1.1 mg/kg
Benzo(k)fluoranthene	*
Indeno(1,2,3-cd)pyrene	38 mg/kg

*Data for "benzo fluoranthene" only was reported in the referenced document and is listed in the table under "Benzo(b)fluoranthene."

5. COC Pathways

The site is located adjacent to the Passaic River (PAP-00065442).

Sanitary and Storm Sewer

According to a *Technical Evaluation*, prepared for legal counsel for Covanta, dated August 26, 2016, the facility has never discharged any industrial process water to the Passaic River at any time, and it discharges only sanitary sewage to the city sewer system. It is reported that "other water" is re-used in the facility's water recycling program installed in 1997 (PAS-00049020).

Direct Release

The site has a NJPDES permit (No. 0055247) that covers the discharge of stormwater to the Passaic River. The permit was effective beginning on February 1, 1986 (PAP-00065627, 29; PAS-00049020). According to an Application for Permit to Discharge Wastewater, dated May 22, 1990, stormwater runoff was treated via oil-water separators (PAS-00082714).

According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, two stormwater ditches are present on the property. Reportedly, both ditches discharge to and receive backflow from the Passaic River (PAS-00049005). On April 15, 1997, ARF completed construction of a stormwater management system, which included converting the two stormwater ditches to stormwater outfalls (outfalls DSN001 and DSN002). This system included a preexisting retention basin that captures stormwater from operational areas.

A figure depicting the location site drainage features and outfalls is provided below (PAP-00065442):

According to a *Technical Evaluation*, prepared for legal counsel for Covanta, dated August 26, 2016, outfall DSN001 was used during facility construction and still exists, though its configuration has changed over time, and it is presently clamped shut under the site's zero discharge configuration. Prior to 1997, DSN001 received flow from the on-site settling pond [including treated construction dewatering effluent (i.e., groundwater) and runoff from the scale house area of the facility] (PAS-00049021). It is reported that sample integrity of DSN001 had been compromised historically due to tidal backup of contaminated Passaic River water to the outfall, as well as contamination entering the drainage ditch from off-site, and contaminated groundwater from construction dewatering and natural seepage. Groundwater from construction dewatering was treated with granular activated carbon prior to discharge. It is reported that available flow data show that during historical facility operations, when the outfall was flowing DNS001 flow was measured in a range of 2.8-40 gallons per minute (PAS-00049021; PAS-00082680; PAS-00082693).

Outfall DSN002 initially was not active at the time of issuance of the NJPDES permit in February 1986 until construction dewatering ceased on March 31, 1989. Outfall DSN002 reportedly is presently clamped shut under the site's zero discharge configuration. According to a *Technical Evaluation*, prepared for legal counsel for Covanta, dated August 26, 2016, when DSN002 flowed, it received site runoff from the administration building, employee parking, and air-cooled condenser areas, as well as from off-site, including from Norpak (formerly Eagle Picher Lead Company), Fairmount Chemical, Blanchard Street, and the adjacent railroad. It is reported that available flow data show that during historical facility operations, when the outfall was flowing, DNS002 flow was measured in a range of 2.8-25 gallons per minute (PAS-00049021; PAS-00082680-81; PAS-00082693-94).

In 1997, Covanta modified the ECRRF's operation to make it a "zero discharge" facility, except during storm events. After 1997, only stormwater associated with non-operational areas (or unusual storm events) is diverted to the stormwater ditches on the property, and that as a result, “only negligible amounts of stormwater have been discharged from the Property to the stormwater ditches since 1997” (PAS-00049006). Under the zero discharge program, the NJPDES permit and outfalls still exist; however, pipes are physically clamped shut (PAS-00049022). According to the facility’s *Stormwater Related Best Management Practices (BMP) and Pollution Prevention Plan*, dated September 2013, since 1997, the stormwater management system has worked as follows:

- The northeastern part of the facility flows into a man-made detention basin that holds the water until it can be used internally. This part of the system has the capability to collect a 2-year, 24-hour storm event. Water collected in this detention basin is then directed to the wastewater storage tank for reuse within the facility’s low-quality water system.
- Stormwater run-off collected on the northwest side of the property is directed into a 10,000-gallon pump pit, which holds water until it can be utilized in the facility’s low-quality water system. After the storm event is over, water from the detention basin is transferred through underground piping to the pump pit near Outfall 002 (DSN 002A) for use in the low-quality water system (PAP-00422053).

The *Stormwater Related Best Management Practices (BMP) and Pollution Prevention Plan*, dated September 2013, goes on to state that the potential for any discharge to surface water is “drastically reduced” through the use of the above-referenced stormwater management system, and that since the 1997 upgrade, an average of one to two discharge events per year has been experienced. After removal of the silt from the stormwater retention basin in 2010, there has only been one discharge which occurred on April 30, 2014, during a storm event (PAP-00422053).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

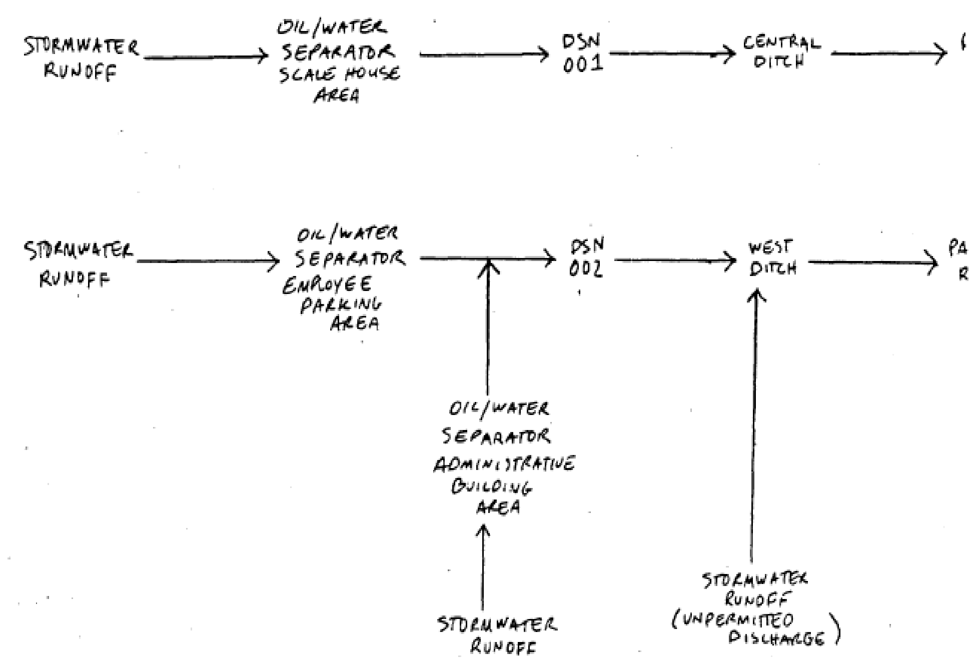
According to a letter prepared by NJDEP, dated June 22, 1988, NJDEP gave the site an "unacceptable" rating following an inspection for failing to monitor stormwater discharges and inaccurately reporting on discharge monitoring reports that there were no stormwater discharges (PAS-00082684).

An October 30, 1991 letter from ARF to NJDEP presents a summary of surveys implemented by ARF “designed to locate potential and actual problem areas” with a potential for impacting stormwater quality, and which ARF was monitoring to reduce any potential for such impact. The letter does not say these areas caused loadings to the LPR, only that the potential for impact to stormwater quality was recognized. The following facility issues were noted in review of operational practices with respect to

stormwater: (1) ash may be tracked out of the ferrous recovery area by the tires on the hauling vehicles, which may cause metals loadings; and, (2) spillage of material in the paved areas by lime slaker and ash load-out buildings may cause metals loadings (PAS-00082770-71). Ash load out was manned daily by housekeeping staff and kept clean using street sweepers and best management practices (PAS-00082822). Stormwater from the ash load out area is routed to a strip drain and sump at the toe of the ramp. Solids from the sump are periodically cleaned out, and water from the sump is recycled in the Facility's low quality water capture and reuse system.

According to a letter from NJDEP to ARF, dated June 10, 1992, based on a compliance inspection, the facility received an "unacceptable" rating due to several issues, including (1) lead effluent violations, among others, between October 1, 1991, and March 31, 1992; (2) operational deficiencies, including the presence of ash piles on the ground; and, (3) the facility's effluent at outfall DSN001 was black at inspection, violating the facility's permit which is for stormwater only. Lead was reported at a concentration of 196 µg/L, over the permit limit of 150 µg/L (PAS-00082812-14). An unpermitted discharge pipe 20 feet from outfall DSN002 was also noted during the inspection (PAS-00082814).

Prior to 1997, DSN001 received flow from the on-site settling pond [including treated construction dewatering effluent (i.e., groundwater) and runoff from the scale house area of the facility] (PAS-00049021). A stormwater flow diagram prepared by the NJDEP inspector at the time of inspection is presented below (PAS-00082819):



According to an April 8, 1991 letter to NJDEP, upon further investigation the potential unpermitted discharge pipe next to DSN 002 cited by Kevin Marlowe was currently not receiving drainage from the site and the origin of the water to the pipe was the West

Ditch tidal water. Once final landscaping is completed, the discharge from this pip would be a combination of on-site and off-site drainage with the majority of drainage contribution origination from off-site. ARF wanted to establish a meeting to address this particular potential discharge point, inclusive of engineered details, history, best management practice approaches available, permitting requirements, etc. (PAS-00049041).

Violations/Enforcement Actions

Violations related to inspections are discussed in the subsection above.

On or about December 1, 1992, NJDEP and ARF entered into an Administrative Consent Order in which NJDEP found that ARF had exceeded certain discharge limits in its NJPDES permit. Compounds discharged in violation of ARF's NJPDES permit included, but were not limited to, lead (PAS-00106056). Lead was the only applicable COC reportedly discharged in violation.

Permits

The site has a NJPDES permit (No. 0055247) that covers the discharge of stormwater to the Passaic River. The permit was effective beginning on February 1, 1986 (PAP-00065627, 29; PAS-00049020). The permit reportedly has been renewed several times (PAS-00049020).

7. Response Actions

Characterization Activities

There is no information regarding characterization activities in the available file material.

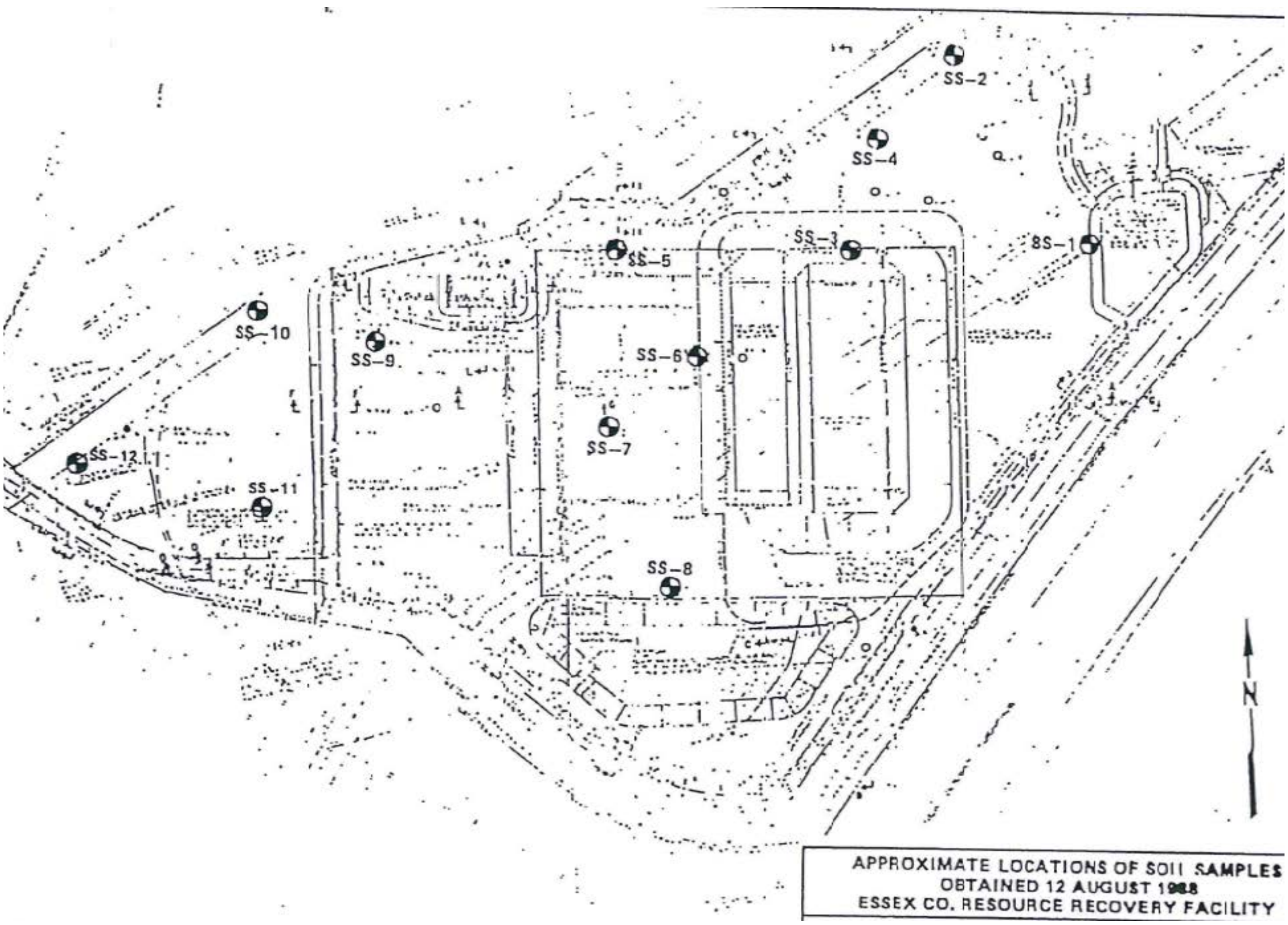
Sewer

There is no information regarding sewer sampling in the available file material.

Soil

No soil sampling data were identified in the available file material for the time period after operation of the ECRRF began in 1990. Surface soil data collected by ARF in August 1988 (prior to construction of the ECRRF) identified PAHs, mercury, copper, and lead in all samples collected. The maximum concentrations of mercury, copper, and lead were 1.6 mg/kg, 130 mg/kg, and 5,880 mg/kg, respectively (PAP-00195134, 36). It is unclear what operations or potential sources of contamination these detections may be associated with based on review of the referenced document.

A sample location figure is depicted below (PAP-00195132):



Remedial Activities

Prior to 1978, the property was vacant and subject to illegal dumping (PAS-00049004). According to a letter prepared by legal counsel for Covanta, dated August 26, 2016, pre-existing contamination was identified at the property in 1982, prior to construction and operation of the ECRRF (PAS-00049004). Reportedly, abandoned vehicles, hundreds of 55-gallon drums, and two tanker trailers of waste were identified on the property. The letter also reports that the property was remediated by the Port Authority (owner) via soil removal or capping. PAHs, copper, lead, and mercury, among other chemicals, were detected in site soil prior to construction of the ECRRF (PAP-00195088-89; PAP-00195120-21). According to the letter, on September 29, 1989, NJDEP determined that no further investigation or remediation was required at the property, provided that ARF seeded, paved, or otherwise covered certain areas of the property to preclude the generation of dust (PAS-00049005). No documents confirming seeding and paving of the property were identified in the available file material.

8. Summary of Asserted Defenses

Covanta asserts that it is not and has never been the "current owner or operator" or "former owner or operator" of the LPRSA [Lower Passaic River Study Area]. Nor is there any evidence or suggestion that Covanta was a transporter of hazardous substances to the LPRSA. Accordingly, it appears that USEPA [United States Environmental Protection Agency] is contending that Covanta may be liable under CERCLA [Comprehensive Environmental Response, Compensation and Liability Act] as an "arranger." Arranger liability requires that Covanta took "intentional steps to dispose of a hazardous substance"….As the United States Supreme Court has explained, "intentional steps" means that it must be proven that Covanta actually intended to dispose of hazardous substances in the LPRSA….Covanta operates, and since 1997 has operated, the ECRRF as a zero discharge facility, except during unusual storm events….The only evidence allegedly connecting Covanta to the LPRSA is the stormwater exceedances in ditches at the Property. These exceedances, however, are not attributable to the ECRRF or Covanta. Instead, these exceedances all stem from pre-existing contamination on the Property – property subjected to illegal dumping, previously owned by the NRHA [Newark Redevelopment and Housing Authority], and currently owned by the Port Authority – as well as offsite, upgradient sources and surface water backflow from the Passaic River. Simply put, there is no evidence that Covanta "disposed of" anything in the LPRSA (i.e., engaged in some active conduct that caused the discharge, deposit, injection, dumping, spilling, leaking, or placing of any hazardous substances in the LPRSA)….Even if evidence of the "disposal" of hazardous substances by Covanta did exist (and it does not), there is no evidence that Covanta intended to dispose of any hazardous substances in the LPRSA. Without intent, Covanta cannot be an arranger under CERCLA – even if Covanta knew or should have known that stormwater runoff carrying pre-existing contamination at the Property or contamination from other parties could discharge to the LPRSA". "Even putting aside the lack of evidence that Covanta is an arranger, there is another problem with seeking to hold Covanta liable under CERCLA for LPRSA impacts: Covanta's hazardous substances, if any, have not caused and will not cause the incurrence of response costs. In order to be liable under CERCLA, Covanta's releases of hazardous substances must cause the incurrence of response costs…. although lead is a COC for the LPRSA, USEPA has determined…that lead is not driving any response actions. In addition, none of the other substances detected in stormwater at the Property are COCs for the LPRSA. As hazardous substances in the Property's stormwater discharges will not cause the incurrence of LPRSA response costs, Covanta cannot be liable under CERCLA. Covanta reserves the right to assert additional defenses in the future".

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

CURTISS-WRIGHT CORPORATION

Facility Name, Address and Size: Curtiss-Wright Corp., 1 Passaic Street, Wood Ridge, New Jersey, 07075 (PAP-00114090); 160 acres (PAP-00190258). The available references did not include information on the number of site employees and typical work shifts.

1. **Business Type:** Airplane part manufacturing and testing facility (PAP-00190259).

2. **Time Period of Ownership/Operations**

   Operator: 1942/1943 to 1981/1983 (PAP-00190346; PAP-00190260)
   Owner: 09/03/1946 to 12/19/2001 (PAP-00190261)

3. **Operational History/COC Use and Presence at the Facility**

   According to the *Final Draft Preliminary Assessment* dated September 19, 1989, Curtiss-Wright operated an aircraft engine manufacturing plant at the site from 1942/1943 until November 1983 (PAP-00190346).

   Operations at this facility consisted primarily of metal working, metal polishing, painting, and metal plating (PAP-00190788). An August 24, 1984, Hazardous Substance / Waste Summary Table reported operations onsite included electroplating, a paint shop and degreasing (PAP-00191091). A June 30, 1984, Storage Vessels / Facilities table reported cutting oils were used in site processes (PAP-00191093).

   The *Preliminary Assessment Report* dated December 5, 2014, reported Curtiss-Wright ceased its operations at the site in 1983 and began leasing portions of the property for use by other companies in the 1980s (PAP-00190259). The *Remedial Action Report for the Former Curtiss-Wright Aerospace Facility* prepared by Langan dated May 2019 (PAP-00393037) notes that tenants at the site included:

   a) Rotary Power International
   b) Fabrite Laminating Corporation
   c) Dannex Manufacturing Corporation
   d) Springfield Precision Instruments
   e) Top Priority Designs
   f) Rose Art Industries, Inc.
   g) Creative Response, Inc.
   h) Carillon Mills, Inc.

4. **Identified COCs**

   - PCBs (used and detected)
   - PAHs (detected)
   - DDx (detected)
   - Copper (used, detected)
   - Lead (used, detected)
   - Mercury (used, detected)

PCBs

A letter reporting the results of an Inspection and Insulating Fluid Evaluation by Burlington Testing Company dated September 7, 1984 stated that 27 of 62 transformers showed evidence of slight leakage at various points, such as gauges, fins, valves, gaskets, tap changer, and bushing throats. Spills at two of the askarel (PCB)-filled transformers were also noted (PAP-00191030). According to the letter, the level of PCB in samples No. 2 and 10, “place them in the PCB category,” i.e., concentration over 500 parts per million (ppm) or milligrams per kilogram (mg/kg). In addition, the level of PCB in thirteen samples, Nos.1, 3, 4, 5, 6, 8, 11, 12, 13, 15, 30, 60, and 61, “place them in the PCB contaminated category” (50-500 ppm) (PAP-00191031). An investigation of a stained area (Area G) adjacent to a transformer located between Buildings 25 and 26 was identified and sampling did not detect PCBs (PAP-00393062).

PAHs

According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had the following maximum concentrations: benzo(a)pyrene, 1,630 µg/kg; chrysene, 2,070 µg/kg; fluoranthene 3,370 µg/kg; phenanthrene, 2,690 µg/kg; pyrene, 2,550 µg/kg (PAP-00456923, 57). Undated subsurface soil sampling results from the oil farm area in Area A included the following maximum concentrations: acenaphthene, 812 µg/kg; anthracene, 194 µg/kg; benzo(a)anthracene, 1,170 µg/kg; benzo(a)pyrene, 2,520 µg/kg; benzo(b)fluoranthene, 4,960 µg/kg; benzo(g,h,i)perylene, 2,050 µg/kg; benzo(k)fluoranthene, 533 µg/kg; chrysene, 2,470 µg/kg; dibenzo(a,h)anthracene, 1,360 µg/kg; fluoranthene 1,390 µg/kg; indeno(1,2,3-cd)pyrene, 2,060 µg/kg; naphthalene, 11,200 µg/kg; phenanthrene, 4,550 µg/kg; pyrene, 2,660 µg/kg (PAP-00456952-3).[1]

The November 4, 2009, Case Inventory Document - Former Curtiss-Wright reported PAHs were detected at an Area of Concern (AOC) G – Transformer Spill Building 25. Based on the results, compliance was achieved with current soil criteria and a No Further Action (NFA) letter was granted by the New Jersey Department of Environmental Protection on October 8, 1993 (PAP-00191098).

According to the 2019 Remedial Action Report prepared by Langan, soil sampling collected on October 19, 1987 contained the following max concentrations in the post excavation soil sampling results from 0.0-0.5 ft bgs (PAP-00393180).

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[1] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights’s previous certification.

Location										
CLIENT ID:	2017 Non- Residential Direct Contact Soil Remediation Standard	SS-A	SS-B	SS-C	SS-D	SS-E	SS-F	SS-G	SS-H	SS-I
COLLECTION DATE:		10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987	10/19/1987
SAMPLE MATRIX:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
SAMPLE TYPE		Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
SAMPLE DEPTH (FT BGS)		0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
SAMPLE UNITS:		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Analyte										
Napthalene	17	0.34U	0.04	0.1	0.34U	3.5UJ	0.04	0.4U	0.24	3.5UJ
Acenapthylene	300000	0.34U	0.36U	0.34U	0.34U	3.5UJ	0.38U	0.4U	0.2	3.5UJ
Fluorene	24000	0.34U	0.04	0.44	0.068	3.5UK	0.38U	0.4U	0.14	3.5UJ
Phenanthrene	300000	0.17	1.4	9.3J	1.16	0.35J	1.3	0.16	4.7J	3.5UJ
Anthracene	30000	0.34U	0.1	1.7	0.2	3.5UJ	0.12	0.4U	0.64	9.9J
Fluoranthene	24000	0.45	4.7	35.4J	6.3	0.84J	5.03	0.32	4.7J	0.9J
Pyrene	18000	0.1	1.2	5.2	1.4	0.35J	1.3	0.077	3.5J	0.7J
Benzo(a)anthracene	17	0.14	2.3	8.9J	1.6	3.5UJ	1.5	0.16	3.5J	3.5UJ
Chrysene	1700	0.1	0.36U	9.3J	1.5	3.5UJ	1.5	0.2	3.5J	0.4J
Benzo(b)fluoranthene	17	0.2	0.36U	0.34U	0.34U	3.5UJ	0.38U	0.4U	0.4U	3.5UJ
Benzo(k)fluoranthene	170	0.34U	0.36U	12.4J	2.1	3.5UJ	2.3	0.16	3.9J	3.5UJ
Benzo(a)pyrene	2	0.1	0.6	9.3J	1.5	3.5UJ	1.5	0.12	2.9	3.5UJ
Indeno(1,2,3-cd)pyrene	17	0.34U	0.36U	3.2	0.92	3.5UJ	0.92	0.4U	1.3	3.5UJ
Dibenz(a,h)anthracene	2	0.34U	0.36U	3	0.34U	3.5UJ	0.38U	0.4U	0.24	3.5UJ
Benzo(g,h,i)perylene	30000	0.34U	0.36U	0.34U	0.34U	3.5UJ	0.38U	0.4U	0.4U	3.5UJ
Acenapthene	37000	0.34U	0.07	0.82	0.14	3.5UJ	0.08	0.4U	0.32	3.5UJ
PHC	--	**2100**	**1170**	**1090**	**1400**	**1650J**	10U	385	790	**33900**
TOC	--	--	--	--	--	--	--	--	--	--
TSS	--	--	--	--	--	--	--	--	--	--
PCB	1	--	--	--	--	--	--	--	--	--
Reactivity (Cyanide)	--	--	--	--	--	--	--	--	--	--
Reactivity (Sulfide)	--	--	--	--	--	--	--	--	--	--
Total PAH	--	--	--	--	--	--	--	--	--	--
Metals										
Arsenic	19	--	--	--	--	--	--	--	--	--
Barium	59000	--	--	--	--	--	--	--	--	--
Cadmium	78	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--	--
Lead	800	--	--	--	--	--	--	--	--	--
Mercury	65	--	--	--	--	--	--	--	--	--
Selenium	5700	--	--	--	--	--	--	--	--	--
Silver	5700	--	--	--	--	--	--	--	--	--

Notes:
U/Pink shaded = MDL exceeds 1987 NRDCSCC
Yellow shaded = Result exceeds 1987 NRDCSCC
Blue shaded = PHC result exceeded 1000 ppm
Dashed line = Result or Standard Unavailable
J = 10x dilution used to calculate results

DDx

According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had one DDT detection at a concentration of 160 mg/kg (PAP-00456923, 57).[2]

Copper

The Remedial Action Report dated May 2019 stated that copper was detected in on-site soils at the AOC referred to as Area D “Surface Stain 30 Foot Test Cells” (PAP-00393057). Sampling identified copper at a concentration of 330 mg/kg (PAP-00393057). Area D was excavated in 1988, post-excavation samples were collected, soil results were below the NJDEP Impact to Groundwater (IGW) clean up criteria, and an NFA was issued for this AOC (PAP-00393059-60).

[2] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights ’s previous certification.

According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had a maximum copper concentration of 491 mg/kg (PAP-00456923, 57).[2]

Industrial wastewater treatment plant sludge analyses dated between May 1980 and January 1984 reported monthly concentrations of copper between 32.5 and 380 mg/kg. Most observations were well under 100 (PAP-00457102-42).[3]

Lead

Lead has been detected in various areas of the Site, including Areas D, I, and J.

Area D is the location of a surface stain and sampling identified lead at an elevated concentration of 2,400 mg/kg (PAP-00191098, PAP-00393057). Area D was excavated in 1988, post-excavation samples were collected, soil results were below the NJDEP Impact to Groundwater (IGW) clean up criteria, and an NFA was issued for this AOC (PAP-00393059-60).

Lead was also detected in soil in Area I. A complaint was filed by a citizen for an area where an unknown substance was reportedly buried, later identified as Area I (PAP-00190985, PAP-00393064). An initial soil sample was tested for EPA priority pollutants with only lead identified at a concentration of 360 mg/kg (PAP-00190985, PAP-00393064). Two 8-foot-square by 2.5-feet deep excavations were completed, and post-excavation sampling showed no elevated concentrations of lead (PAP-00393064-65).

Lead was also identified in the southeast area of building 56 located in the former landfill area, Area J (PAP-00393065). Following drum removal at the landfill, samples were collected from underlying soil for lead analysis. Results showed that concentrations of lead exceeded SCC in two locations (PAP-00393066). According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had a maximum lead concentration of 61 mg/kg (PAP-00456923, 57).[3] Implementation of a 1994 Landfill Disruption and Closure Plan excavated three areas within the landfill and consolidated the removed material into a central area (Area M) for capping and closure. The excavation at Area J was sampled and backfilled with clean soil. The NJDEP approved No Further Action for Area J in 1999 (PAP-00393067-69).

Industrial wastewater treatment plant sludge analyses dated between May 1980 and January 1984 reported monthly concentrations of lead ranging from <0.1 to 190 mg/kg. Most observations were well under 100 (PAP-00457102-42).[3]

[3] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

Mercury

The Remedial Action Report dated May 2019 stated that elevated levels of mercury were detected in the AOC referred to as Area D "Surface Stain 30 Foot Test Cells" (PAP-00393057). Specifically, mercury was detected at 8.6 mg/kg, above background (PAP-00393057). Additional sampling in this AOC detected mercury at concentrations of 1.2 mg/kg in 1988 and 19.5 mg/kg and 21.7 mg/kg in 1993 (PAP-00393058-59). Area D was excavated in 1988, post-excavation samples were collected, soil results were below the NJDEP Impact to Groundwater (IGW) clean up criteria, and an NFA was issued for this AOC (PAP-00393059-60).

According to an incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, soil samples collected on December 10 and 11, 1987, in Area J from the base of each of six test pit excavations had a maximum mercury concentration of 4.8 mg/kg (PAP-00456923, 57).[4]

Historic Fill

The Allocation Team has determined that the facility site is not located on regional historic fill as designated by the NJDEP.[5] Based on review of available documents, no soil sampling data was available.

The New Jersey Department of Environmental Protection (NJDEP) has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[6] Accordingly, NJDEP technical requirements for property containing historic fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[7] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of historic fill at varying levels, not atypically at or exceeding residential soil standards.[8]

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[4] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

[5] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[6] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[7] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[8] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00393180, 279; PAP-00191098, PAP-00393057-59, PAP-0045957).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,400 mg/kg
Copper	491 mg/kg [4]
Mercury	21.7 mg/kg
Benzo(a)anthracene	40.2 mg/kg
Benzo(a)pyrene	33.7 mg/kg
Benzo(b)fluoranthene	51.1 mg/kg
Benzo(k)fluoranthene	2.3 mg/kg
Dibenzo(a,h)anthracene	3.6 mg/kg
Indeno(1,2,3-cd)pyrene	21.6 mg/kg

5. COC Pathways

Sanitary and Storm Sewer

An October 20, 1987 letter from Curtiss-Wright to NJDEP states that the surface water at the Curtiss-Wright facility drained through stormwater collection drains. Runoff was discharged from the storm sewer system to Feld Brook, which connects to the Saddle River, a tributary of the Passaic River. Specifically, the upper portion of the site is transacted by north-south oriented surface water collection trenches. The remainder of the surface water from the site is drained through stormwater collection drains located throughout the property. Roof drains discharge to the stormwater system. The stormwater and roof drain system for the site collected in a large collection basin at the western end of the site. No information was identified in available files that documented treatment of storm water prior to discharge. The letter states that the Fabrite Laminating Company and John Deere's sloppy waste drum storage areas contributed to the stormwater system. Fabrite Laminating Company's drum storage area was directly adjacent to a storm water drain and a stained area suggested that hazardous materials were discharging to the stormwater system (PAP-00190229-30, PAP-00456900-1).

Furthermore, the letter reported surface water runoff from the Curtiss-Wright facility was discharged from the storm sewer to Feld Brook, just to the west of the facility. To evaluate the possibility that contamination from the site may have been affecting Feld Brook, one surface water sample and one sediment sample were collected from Feld Brook at a point just downstream from the facility in 1987. These samples were analyzed for priority pollutant volatile organics and base/neutral organic compounds. The analytical results for the surface water samples showed the presence of several volatile organic compounds (VOCs); no OU2 COCs were detected. Fourteen base neutral organic compounds were detected in the sediment sample, "suggest[ing] that previous discharges to the Brook contained significant base/neutral contamination", and 350 ppm of total petroleum hydrocarbons was also detected (PAP-00190231). An

undated single-page document, labeled "Table 5 Summary of Analytical Results Surface Water and Sediment Samples Feld Brook" presents detections of four compounds in surface water, and 16 compounds in sediment, including (concentrations in ppb) acenaphtene (312), anthracene (1,100), benzo(a)anthracene (1,400), benzo(a)pyrene (746), benzo(b)fluoranthene (2,120), chrysene (1,760), fluoranthene (5,180), fluorene (459), indeno(1,2,3-c,d)pyrene (328), naphthalene (104) and pyrene (4,420). Total petroleum hydrocarbons were reported at 350 ppm (PAP-00456906).[9]

Industrial wastewater treatment plant sludge analyses dated between May 1980 and January 1984 reported monthly concentrations of copper between 32.5 and 380 mg/kg. Lead concentrations ranged from <0.1 to 190 mg/kg. Most observations for both were well under 100 (PAP-00457102-42).[9]

Direct Release

No information on direct releases to the Passaic River was identified in the available file material. However, according to a Passaic Valley Sewerage Commissioners (PVSC) letter report of pollutions corrected in 1969, dated March 31, 1970, there were intermittent polluting discharges in 1968 from Curtiss-Wright to Felds Brook, which the report described as a tributary to the Passaic River. Upon notification, the plant engineer explained that this occurred during filter changes and that extra care would be taken so that no oil would reach the brook again. However, oil was detected again on December 3, 1968 and traced back to Curtiss-Wright. On December 10, 1968, Curtiss-Wright was informed that they were polluting and that they needed to make corrections immediately. PVSC received a letter on December 26, 1968 from Curtiss-Wright that stated that consultants were being brought in to review the system in order to make necessary improvements. The report continued: "The situation continued much the same and finally on March 12, 1969, Mr. Lubetkin [of PVSC] again wrote to the Curtiss-Wright Corp." (PAS-00008279). Note at this point the first page of the letter report ends and the next page is numbered 12 and discusses another entity's pollution.

Spills

According to the Case Inventory Document for the Former Curtiss Wright, dated November 4, 2009, excavation took place at one transformer pad (AOC H – Transformer Stain Building 3) due to elevated PCB concentrations as a result of an oil spill adjacent to the pad near Building 22. An NFA was granted by NJDEP in a letter dated October 8, 1993 (PAP-00191098).

6. Regulatory History/Enforcement Actions

Inspections

An *Inspection and Insulating Fluid Evaluation for PCB Content for Sixty Two Transformers* was conducted by Burlington Testing Company in September 1984. It is

[9] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

not stated in the report what prompted the inspection. PCBs were detected in many of the transformers (PAP-00191030). The results are discussed in greater detail in the PCBs portion of Section 4, above.

Violations

Curtiss-Wright's 1984 Initial ECRA Notice Submission states, "there have been no known Departmental or other Governmental enforcement actions related to the site for violations of any applicable federal, state or local environmental laws or regulations throughout the history of ownership of the site (PAP-00191104)."

Permits

Stormwater at the facility drained through stormwater collection drains and was discharged to Felds Brook under the NJPDES Discharge Permit No. NJ0022004 (PAP-00191111). Monthly waste water sample data from October, 1979, to July, 1984, reported results for pH, suspended solids, chemical oxygen demand, oil and grease, as well as chromium, copper, lead, nickel, and zinc (PAP-0456964-101).[10]

In addition, a NJPDES/Discharge to Groundwater (NJPDES/DGW) Permit (No. NJ7001312) was issued on February 27, 1996 for the discharge of treated groundwater from the treatment system via onsite injection wells. The NJPDES permit expired and was transferred to a long-term Permit by Rule (PBR); NJDEP approval for the PBR was provided in correspondence dated November 16, 2009 A PBR Renewal Application for NJPDES/DGW Permit No. NJ7001312 was submitted to NJDEP on May 26, 2017. On February 15, 2019, Langan submitted a technical response to NJDEP's July 19, 2018 correspondence regarding the permit renewal submission on behalf of Curtiss-Wright (PAP-00393120).

7. Response Actions

Characterization Activities

Upon cessation of operations, Curtiss-Wright was required to perform investigation and remediation of the Site. In relation to Curtiss-Wright's cessation, 20 Areas of Concern ("AOC") were identified and NJDEP has issued No Further Action letters ("NFA") for 18 of 20 AOCs related to Curtiss-Wright. In addition, the sale of the Site to Wood-Ridge Industrial Property Owner, LLC triggered the Industrial Site Recovery Act ("ISRA") for eight of Curtiss-Wright's tenants (PAP-00393036).

The following characterization activities have taken place at the facility:

- *Preliminary Assessment Report for Former Fabrite Laminating Corporation Tenant Space*, by Langan Engineering and Environmental Services, dated December 2014 (PAP-00190252).

[10] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

- *Baseline Ecological Evaluation for the Curtiss-Wright Facility*, by Peak Environmental, Inc., dated January 2004 (PAP-00190991).
- *Remedial Action Report for Former Curtiss-Wright Aerospace Facility*, by Langan Engineering and Environmental Services, dated May 2019 (PAP-00393017)

Additional supporting documentation as identified in the 2019 Remedial Action Report (PAP-0039017) are identified below:

- November 30, 1989 Cleanup Plan and Addendums
- NJDEP approval of the Cleanup Plan on January 30, 1991, established the SCC as the remediation standards for the Site
- January 15, 1993 Soil Cleanup Plan and April 15, 1993 Groundwater Cleanup Plan; NJDEP approval of these workplans on October 8, 1993 established the SCC and Groundwater Quality Standards as the applicable standards
- October 31, 2006 Curtiss-Wright Response to NJDEP Comment Letter of 14 September, 2006
- December 4, 2006 Quarterly Remedial Action Report, March and June 2006 Groundwater Monitoring Events
- February 13, 2007 Pin Code Request for Application for an Air Emissions Permit During and Environmental Improvement Pilot Test for the Soil Vapor Extraction (SVE) System
- February 15, 2007 Application for an Air Emissions Permit during an Environmental Improvement Pilot Test for the SVE System
- April 2, 2007 Receptor Evaluation Application for an Air Emissions Permit during the Environmental Improvement Pilot Test for the SVE System
- June 29, 2007 Curtiss-Wright Response to NJDEP Comment Letter of 17 May 17, 2007
- August 28, 2007 Quarterly Ground Water Remedial Action Report for the December 2006 Groundwater Sampling Event
- November 26, 2007 Quarterly Remedial Action Report March for the June
- 2007 Groundwater Sampling Events
- January 21, 2008 Air Pollution Control Permit Modification issued to Curtiss-Wright by NJDEP
- January 22, 2008 Quarterly Remedial Action Report for the October 2007 Groundwater Sampling Event
- February 15, 2008 Remedial Investigation Workplan and Addendums submitted by Curtiss-Wright, which were approved by NJDEP on 7 December 7, 2009
- April 7, 2008 Quarterly Remedial Action Report for the December 2007 Groundwater Monitoring Event
- July 28, 2008 Application for an Air Emissions Permit Modification;
- September 10, 2008 Semiannual Ground Water Remedial Action
- March 11, 2009 Remedial Investigation Workplan Addendum
- June 8, 2009 Semiannual Ground Water Remedial Action Report for the December 2008 Groundwater Sampling Event
- November 12, 2009 Semiannual Ground Water Remedial Action Report for the June 2009 Groundwater Sampling Event

- February 17, 2010 Remedial Investigation Report
- June 10, 2010 Semi-Annual Remedial Action Report for the December 2009 Groundwater Monitoring Event
- July 16, 2010 Vapor Intrusion Remedial Investigation Report
- November 19, 2010 Semi-Annual Remedial Action Report for the June 2010 Groundwater Monitoring Event
- February 25, 2011 Receptor Evaluation submitted to NJDEP by Curtiss-Wright
- April 19, 2011 LSRP Notification of Retention of Robert Y. Koto, LSRP by Curtiss-Wright
- March 16, 2012 Remedial Action Report
- December 2010, May & October 2011 Groundwater Monitoring Event
- 5 December 2014 Receptor Evaluation for Former Fabrite Laminationn Corporation
- December 5, 2014 Preliminary Assessment Report for Former Fabrite Lamination Corporation Tenant Space prepared by Langan for Curtiss-Wright
- December 19, 2014 Vapor Intrusion Work Plan prepared by Langan
- May 8, 2015 Sub-Slab Soil Gas Sampling Work Plan prepared by Langan
- October 8, 2015 Sub-Slab Soil Gas, Soil, Overburden Groundwater and Indoor Air Sampling Work Plan prepared by Langan
- May 26, 2017 Discharge to Groundwater (DGW) Permit-By-Rule Authorization issued to Curtiss-Wright by NJDEP
- May 26, 2017 Final Permit-By-Rule Application New Jersey Pollutant Discharge Elimination Discharge to Groundwater (NJPDE-DGW) Permit Renewal Application prepared by Langan for Curtiss-Wright;
- June 30, 2017 Groundwater Remedial Action Progress Report prepared by Langan;
- September 15, 2017 Curtiss-Wright Response to NJDEP Case No. 17-07-11-0814-32 concerning reported PCE in Groundwater at Farmland Dairies;
- October 10, 2018 SVE and Pump and Treat System Effectiveness Evaluation Work Plan – Phase 2 Activities prepared by Langan for Curtiss-Wright;
- November 9, 2018 Revised Remedial Action Work Plan – Former Rotary Power International Facility prepared by Langan for Curtiss-Wright;
- November 26, 2018 SVE Discharge Piping Replacement and Blower Refurbishment Work Plan prepared by Langan Curtiss-Wright;
- January 14, 2019 Supplement to October 10, 2018 SVE and Pump and Treat System Effectiveness Evaluation Work Plan – Phase II Activities prepared by Langan for Curtiss-Wright;
- February 28, 2019 Work Plan For PCB Remedial Action Confirmation Sampling prepared by Langan for Curtiss-Wright;
- April 2, 2019 Building 2 Remedial Action Work Plan prepared by Langan for Curtiss-Wright;
- April 10, 2019 Rotary Power Pre-Excavation Sampling Work Plan prepared by Langan for Curtiss-Wright;

Sewer

Monthly waste water sample data from October, 1979, to July, 1984, reported results for copper and lead (PAP-0456964-101). Until early 1981, copper and lead concentrations were consistently reported as <0.2 ppm, and later results were below lower levels of detection. The one exception was a sample collected in February, 1983, in which copper was detected in duplicate samples at 0.72 ppm and 0.66 ppm (PAP-00457009). One sample from June, 1981, included a longer list of metals, including mercury, which was reported as 0.0009 ppm (PAP-00457060).[11]

Soil

Peak Environmental conducted a *Baseline Ecological Evaluation (BEE)* in January 2004. The BEE stated that the specific AOCs addressed were impacted soils associated with a former underground storage tank (UST) farm on northwest portions of the site (Area A), and a plume of impacted groundwater, the primary source of which was attributable to Area A. The contaminants were VOCs and TPH (PAP-00190995). No OU2 COCs were reportedly detected. However, available references did not include the specific sample results.

The BEE reported the cessation of site operations in 1983 triggered the Environmental Cleanup and Responsibility Act (ECRA-later known as ISRA). AOCs identified in the initial *General Information Submission (GIS)* and *Site Environmental Submission (SES)* dated July 27, 1984 and September 10, 1984, respectively, consisted of an UST farm, surface spill areas, a landfill area, oil spill areas, aboveground storage tanks, and groundwater (PAP-00190994). Subsequent AOC Remedial Investigations/Actions conducted during the late 1980's and 1990s yielded NFA determinations from the NJDEP for the majority of AOCs on site. The remaining AOCs for which active remediation was being conducted included the Oil and Fuel Tank Farms and Site Groundwater. Peak concluded that there was a pathway from the site to Feld Brook, but that there were no signs of impact to Feld Brook from the facility storm water discharges (PAP-00190991-1029).

Remedial Activities

An incomplete and undated Curtiss-Wright Corporation On-Site Cleanup Plan, describes sampling activities in several areas of the site in the late 1980s. Analytical results included the following:

Area A – Oil and Fuel Tank Farm: borings were advanced in the oil farm area, containing 45 USTs, sometime in the late 1980s. Subsurface soil sampling results included the following maximum concentrations: acenaphthene, 812 µg/kg; anthracene, 194 µg/kg; benzo(a)anthracene, 1,170 µg/kg; benzo(a)pyrene, 2,520 µg/kg; benzo(b)fluoranthene, 4,960 µg/kg; benzo(g,h,i)perylene, 2,050 µg/kg; benzo(k)fluoranthene, 533 µg/kg; chrysene, 2,470 µg/kg; dibenzo(a,h)anthracene, 1,360 µg/kg; fluoranthene 1,390 µg/kg;

[11] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

indeno(1,2,3-cd)pyrene, 2,060 µg/kg; naphthalene, 11,200 µg/kg; phenanthrene, 4,550 µg/kg; pyrene, 2,660 µg/kg (PAP-00456952-3).[12]

Area J – Six test pits were excavated and identified the presence of eight empty buried drums. Soil samples collected on December 10 and 11, 1987, from the base of each excavation below the location of the drums were analyzed for EPA Priority Pollutants. Maximum concentrations of the following constituents were as follows: benzo(a)pyrene, 1,630 µg/kg; chrysene, 2,070 µg/kg; fluoranthene 3,370 µg/kg; phenanthrene, 2,690 µg/kg; pyrene, 2,550 µg/kg; DDT, 160 µg/kg; copper, 491 mg/kg; lead, 61 mg/kg; mercury, 4.8 mg/kg (PAP-00456923, 57).[12]

The 2019 Remedial Action Report provides a summary of activities at the Site (PAP-00393017). AOCs with soil impacted with COCs of interest are discussed below:

Area D – Surface Stain 30 Foot Test Cells: In 1985, six soil borings were completed for this AOC. The samples were collected and analyzed for TPH and PP+40. Contaminants detected at levels in excess of NJDEP action limits included, TPH (110,000 mg/kg), cadmium (14 mg/kg), copper (330 mg/kg), lead (2,400 mg/kg), and zinc (770 mg/kg). In addition, elevated levels of mercury were also detected at 8.6 mg/kg, above background measurements of 0.02 to 0.6 mg/kg. Based on the sampling results, impacted soils were excavated to various depths and removed from the Site. Following post-excavation sampling and additional soil removal at the request of NJDEP, on December 15, 1998, an NFA was issued for this AOC (PAP-00393057-60).

Area G – Transformer Spill Building 25: in 1984, a fluid analysis was completed for 62 transformers on the Site. Twenty-seven of the 62 Site transformers showed signs of leaking. Sampling did not detect any PCBs, but did detect elevated levels of TPH. Following additional TPH sampling, the TPH impacted soils were excavated and an NFA was issued on October 8, 1993 (PAP-00393062-63).

Area H – Transformer Stain Building 3: a 25-square foot area of stained soil was identified during a site inspected. Initial sampling did not detect PCBs, but did identify elevated levels of TPH. Following excavation of the impacted soils and post-excavation sampling, additional excavation was required for TPH impacted soils. An NFA was issued by NJDEP on October 8, 1993 (PAP-00393063-34).

Area I – Citizen Complaint Area: this AOC consisted of a 150-foot by 300-foot section of a wooded area and includes Area J, discussed below. Initial sampling in the area of decaying steel drum identified elevated levels of lead. Additional sampling identified zinc in the area. An 8-foot-square section was excavated and an NFA was issued on March 26, 1990 (PAP-00393064-65).

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[12] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights 's previous certification.

Area J – Landfill: In 1989, six test pits were advanced based on a magnetometer survey. The date in this summary conflicts with the date (1987) in which sample results for these test pits was reported (PAP-00456957).[13] An area within the landfill located southeast of Building 56, was identified as the location of multiple, white piles of materials. The material was sampled and the results identified elevated levels of arsenic, lead, zinc, and PAHs. In 1993, 10 test pits were excavated in this area and sampled. The test pit sampling showed elevated levels of PAHs and arsenic, chromium, cadmium, and nickel. In 1994, a Landfill Disruption and Closure Plan was prepared. The plan consisted of excavating three areas within the landfill and consolidating the removed material into a central area for capping and closure. Following completion of the excavation and backfilling of the area, a deed notice for the area was filed on December 15, 1999 and an NFA was approved by NJDEP for this AOC on March 14, 2000 (PAP-00393065-69).

Electro-Chemical Machining (ECM) Tank and Pump Room Area: this AOC consisted of three ECM tanks, including two open top 45,000-gallon concrete settling tanks, on 6,000-gallon brine tank, and a pump room. An initial soil investigation of this AOC identified elevated concentrations of TPH and PAH compounds. A monitoring well was installed to determine if the soil was impacting the groundwater. The tanks were emptied and backfilled with inert soil from on-site. A second and third investigation of this AOC continued to show elevated levels of TPH and PAH compounds. A final round of soil borings and sampling in 1992 concluded that compliance with applicable soil cleanup standards was achieved for all VOC and base neutral constituents. In 1996, approximately 1,675 tons of soil was removed from this AOC. Following a second soil excavation in this AOC and post-excavation sampling, an NFA was issued on June 4, 1997 (PAP-00393079-81).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

[13] This Report was revised to include documents received on May 8, 2020. The additional documents did not change Curtiss-Wrights ’s previous certification.

DII INDUSTRIES, LLC

Facility Name, Address and Size: Dresser Industries, Inc. / DII Industries (Dresser); 401 Worthington Avenue, Harrison, NJ 07029; approximately 23 acres (PAS-00063866; PAS-00122467). The available references did not include information on the number of site employees and typical work shifts.

1. **Business Type:** The Worthington Avenue facility was used for manufacture of specialty pumps. Although pump casings were cast on site in the past, raw castings and finished parts are now received from outside vendors (PAS-00122467).

2. **Time Period of Ownership/Operations**

    Operator: January 1985 to January 1993 (PAS-00023354)
    Owner: January 1985 to February 1997 (PAS-00023618; PAS-00122467)

    The facility operated as a specialty pump manufacturing facility from approximately 1906 until 1993 (PAS-00023030, PAS-00023265). The Worthington Service Corporation, which was incorporated in 1971, owned the Worthington Facility until 1979 (PAP-00402657-60, PAS-00023030, PAS-0006881). From 1980 to 1985, the facility real property was owned by indirect subsidiaries of McGraw-Edison, a predecessor-by-merger of Cooper Industries PAP-00402663-68). From 1985 to 1997, the facility was owned by Dresser (PAS-00063866). Dresser/DII, which is the subject of this data report, ceased commercial or manufacturing operations at the plant in October 1993 (PAS-0063866, PAS-00122467).

3. **Operational History/COC Use and Presence at the Facility**

    The facility manufactured specialty pumps from approximately 1906 until it ceased operation in 1993 (PAS-0023265). During the approximately 87 years of operation, raw castings were manufactured on site. The raw castings were forged, machined, and the pumps were assembled at the facility. Pump hydro-testing was performed within the manufacturing area and foundry operations involved the use of large quantities of oil and electricity. Many machining operations involved the use of solvents and lubricating oils during this 87-year period (PAS-0023265).

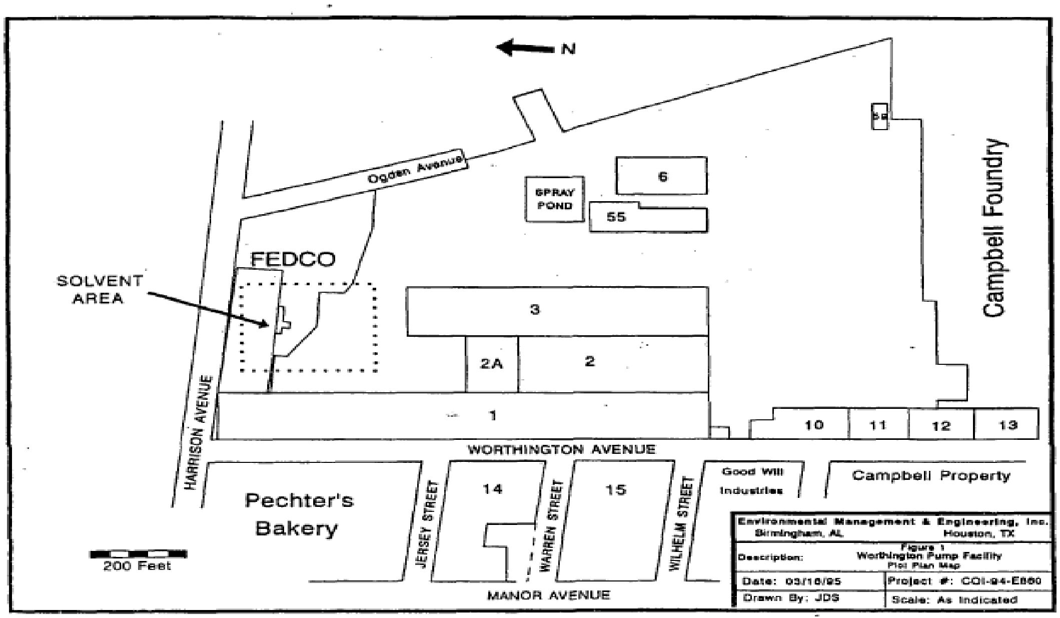
    According to a *Response to CERCLA Section 104 (e) Request Letter*, dated December 2000, Dresser's manufacturing operations at the Worthington Avenue facility from 1985 to 1993 involved the manufacture of reciprocal and centrifugal pumps, such as water pumps, boiler pumps, trident pumps, and hoovering pumps. Dresser would purchase raw solid metal casings, composed of metals such as steel, iron, copper, and titanium from various third party suppliers. The first phase of Dresser's manufacturing process involved the cutting and machining of these metal casings into the component parts, which would ultimately comprise the particular type of pump. The second and last phase of the manufacturing process would involve the assembly of the component parts with the necessary electrical wiring and components purchased from third party suppliers. After manufacturing the pumps, Dresser would hydrotest each pump's operation in

concrete test vaults filled with city water and, if the pump was fully operable, Dresser would clean, paint, and ship the pump to the relevant customer (PAS-00063869).

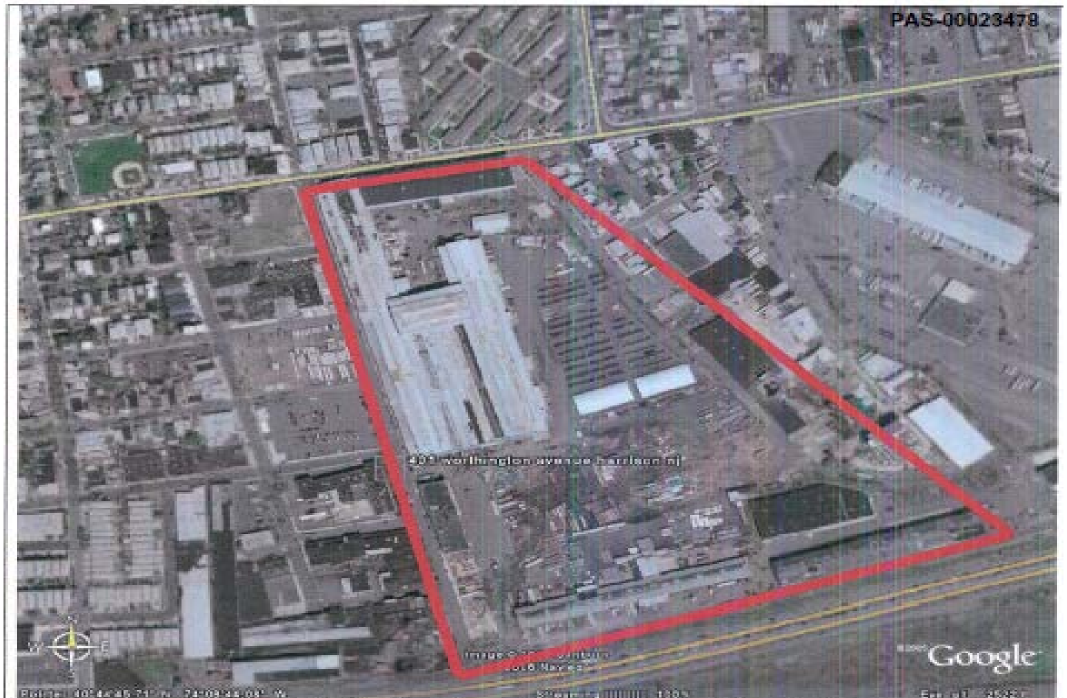
In the *Response to CERCLA Section 104 (e) Request Letter*, dated December 2000, Dresser states, "In Dresser's industrial operations at the Worthington Facility, Dresser did not manufacture any products in which any hazardous substances were the product. Dresser's manufacturing operations solely involved the manufacture of various type of pumps containing as part of their physical composition certain metals, such as steel, iron, copper, and titanium, depending on the particular type of pump." The only reported byproducts resulting from Dresser's industrial operations at the Worthington Avenue facility were metallic chips and shavings that resulted from Dresser's cutting and machining of the solid metal casings. (PAS-00063869-70).

The *Response to CERCLA Section 104 (e) Request Letter*, dated December 2000, also states that Dresser has not been able to determine the amount of hazardous substances generated per volume of finished product. However, Dresser estimated that approximately 80 percent by weight of the raw metal castings were ultimately used in the products and therefore 20 percent or less of the metal casting resulted in metallic chips and shavings. Dresser has not been able to determine how much of the metallic chips and shavings constituted hazardous substances (PAS-00063870).

Dresser also states in the *Response to CERCLA Section 104 (e) Request Letter,* dated December 2000; that the metallic chips and shavings were not combined with any other wastes, but rather were collected, segregated, stored, and ultimately sold to a third party scrap metal recycler. Metonis Scrap Metals of Kearney, New Jersey was a scrap metal recycler that had purchased some of the metallic chips and shavings from Dresser (PAS-00063870).

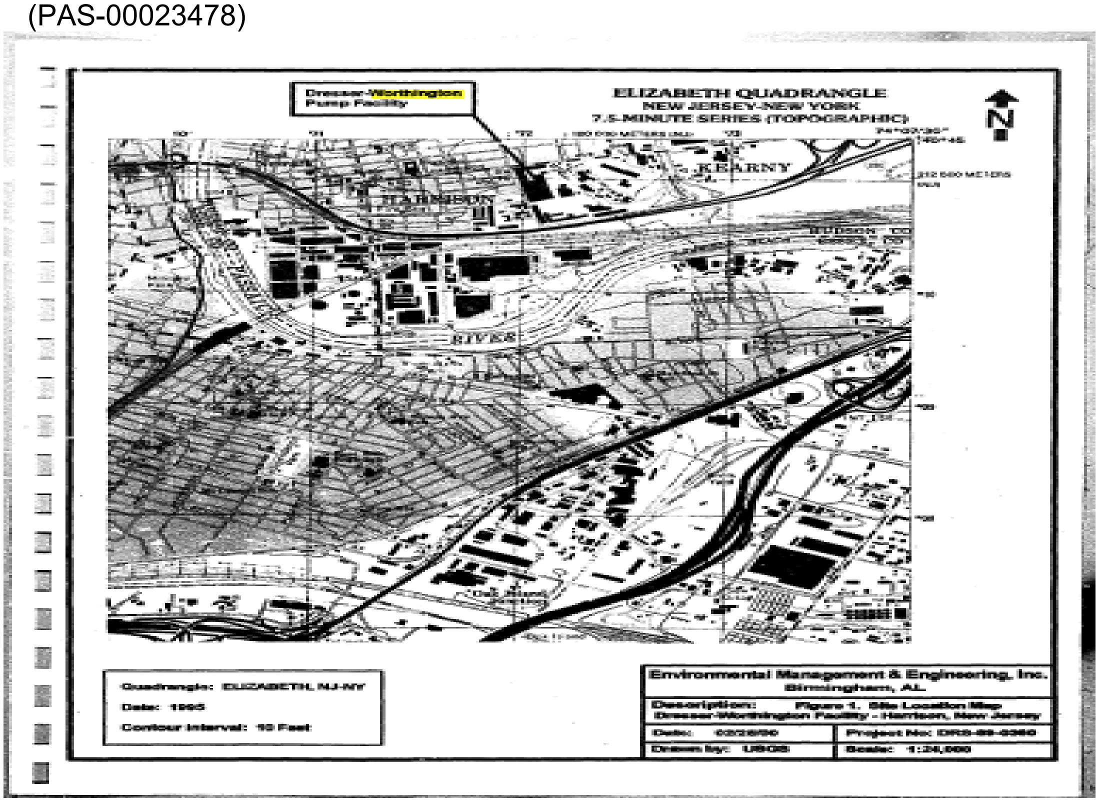


(PAS-00023583)



Halliburton Company/ Worthington Dresser
401 Worthington Avenue
Harrison, NJ 07029

(PAS-00023478)



(PAP-00033681)

The following hazardous substances were stored in one or more buildings, which had a roof and a concrete floor (PAS-00063874-75).

Stored Hazardous Substances	
Substance	**Storage Container**
Acetone	Closed glass bottle or jug
Acetylene tetrabromide	Closed glass bottle or jug
Ammonia	Closed glass bottle or jug
Hydrochloric Acid	Closed glass bottle or jug
Mercury	Closed glass bottle or jug
Nitric Acid	Closed glass bottle or jug
Phosphoric Acid	Closed glass bottle or jug
Acetylene	Sealed cylinder
Argon	Sealed cylinder
Chlorodifluoromethane	Sealed cylinder
Chloropentafluoromethane	Sealed cylinder
Chlorotrifluoromethane	Sealed cylinder
Antimony	Tote bin
Asbestos	In insulation
2 butoxy ethanol	Closed can
Chlorine	Closed fiber drum
Chromium	Tote bin
Copper	Tote bin
Dibutylphthalate	Closed can
Dichlorofluoromethane	Sealed cylinder
Lead	Tote bin
111, trichloroethane	Closed steel drum
Naptha	Closed steel drum
Nickel	Tote bin
Polychlorinated biphenyls	Sealed transformer
Sodium bisulfide	Closed steel drum
Sodium hydroxide	Closed steel drum
Sodium nitrate	Closed steel drum
Sulfur	Closed steel drum
Toluene	Closed steel drum
Xylene	Closed steel drum

4. Identified COCs

- PCBs (used)
- PAHs (detected)
- Copper (used)
- Lead (used)
- Mercury (used)

PCBs

At the time Dresser took possession of the site in 1985, there were approximately 16 transformers on the site (PAS-00023666). A McGraw-Edison report, *Sampling Plan Worthington Pump Division*, written around 1984 noted that two transformers contained 10,000 parts per million (ppm) PCB and fourteen contained 50 to 80 ppm PCB (PAS-

00023666). At least one unidentified transformer containing PCBs was noted to have been removed from the site in a Report of Inspection dated February 1987 (PAP-00216835). There have been no known spills of transformer oil (PAS-00022925). A total of seven samples, 4c-(1-7) were collected in May 1989 outside the eastern portion of the foundry building, and adjacent to the locomotive building. This area was characterized having scattered piles of waste material and heavy vegetation (PAS-00023057). The maximum detected PCB concentration was Aroclor-1254 at 31 microgram per gram (µg/g) collected from soil sample 4c-4 at a depth of 0-6 inches (PAS-00023060).

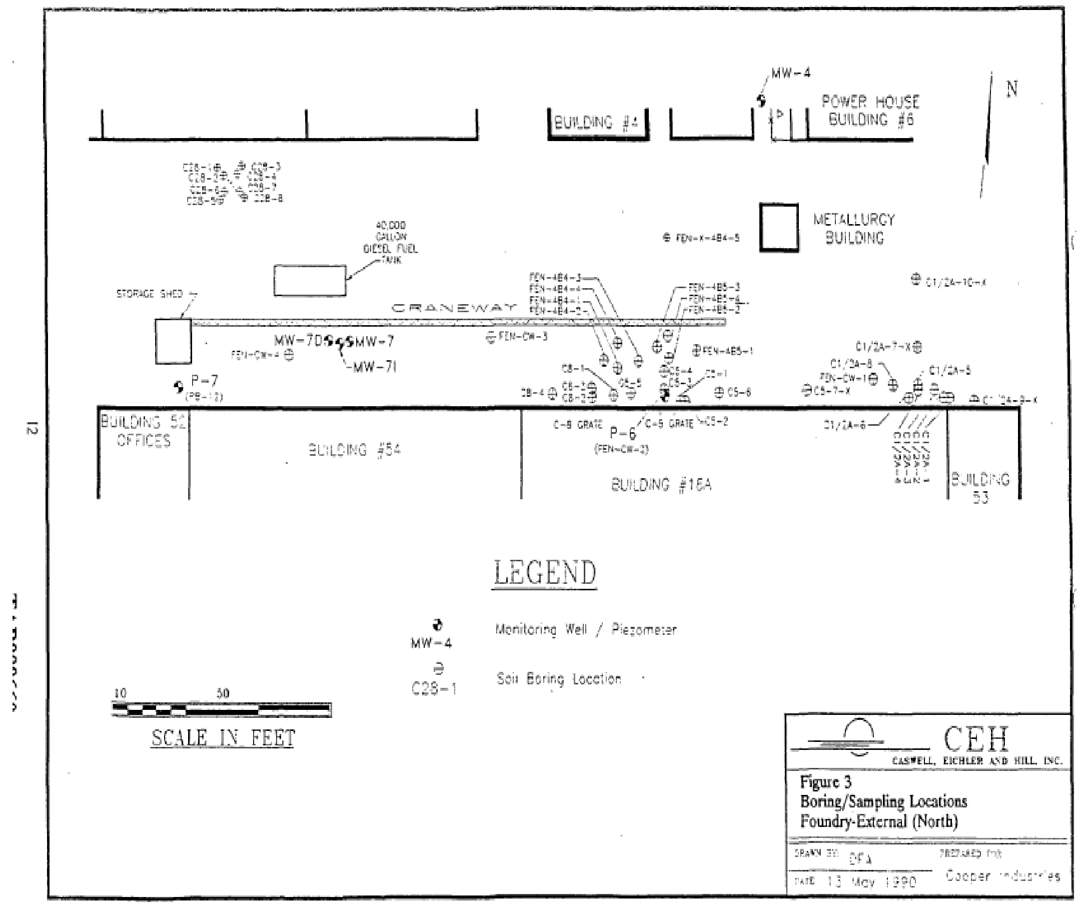
Fifty-four catch basins were located on the Dresser Facility. During the course of the field investigations conducted in May 1989, each of these catch basins was cleaned out and inspected. Sediments from the most upgradient and most downgradient catch basins were analyzed for PCBs and metals. In addition, soils adjacent to the catch basins were also collected and analyzed for metals and PCBs (PAS-00023083). The PCB, Aroclor-1254 was detected in catch basins C-33 and C-34 at concentrations of 4.4 µg/kg and 5.6 µg/kg (PAS-00023085). In addition, the PCB Aroclor-1260 was detected in soil collected adjacent to cracked basins (C-19, C-28, C-32, C-39 (duplicate), and C-48) at a maximum concentration of 19 ppm collected from catch basin (C-32) (PAS-00023089).

PAHs

Reports state that there are three 30,000 gallon underground storage tanks that contained No. 2 fuel oil (PAS-00023039) and a 200,000 gallon aboveground tank that contained No. 6 fuel oil (PAS-00023541; PAS-00122235). There may have also been an additional two 5,000 gallon underground storage tanks that contained No. 2 fuel oil. Available references do not provide specific information related to any known releases from these tanks. However, both high and low molecular weight PAHs were detected in sediment samples collected from catch basins (PAS-00023212-14).

Copper

Copper was listed as “casting” used throughout the Worthington Avenue facility on reports through 1992 (PAS-00023015). A *Monthly Status Report*, dated July 28, 1989 states that metals were detected in most soil samples at elevated concentrations with the maximum of 61,000 ppm of copper in a soil sample collected north of the foundry building in sample 4b-2 at a depth of 0-6 inches bgs in May 1989 (PAS-00023024, 61).



PAS-00023123

Copper was also detected in several sediment samples collected from selected catch basins. Copper was detected at a maximum concentration of 68,000 ppm from a sediment sample collected from a catch basin C50 on May 5, 1989 (PAS-00023086).

Lead

Lead was listed as "casting content" stored onsite (PAS-00023017). Lead may have also been present in fuel oils or gasoline stored at the Worthington Avenue facility, but testing of samples around the gasoline tanks found lead below cleanup levels with many samples listed as non-detects (PAS-00065847, 49). These tanks were located directly in front of the maintenance garage near the eastern end of the property. The tanks, pumps, and piping were excavated and cleaned according to the Tank Decommissioning Plan and consistent with the requirements of 7:26E-6.3, with sludge and remaining product drummed for disposal. Based on the post remedial soil sampling results, no further action was proposed for soil (PAS-00065843-50). As mentioned above, a *Monthly Status Report*, dated July 28, 1989 states that metals were detected in most soil samples at elevated concentrations with the maximum of 7,900 ppm of lead in a soil sample collected north of the foundry building (PAS-00023024).

Fifty-four catch basins were located on the Dresser Facility. During the course of the field investigations conducted in May 1989, each of these catch basins were cleaned out and inspected. Sediments from the most up-gradient and most down-gradient catch basins were analyzed for PCBs and metals. In addition, soils adjacent to the catch basins were also collected and analyzed for metals and PCBs (PAS-00023083). Lead was detected in sediment samples collected from catch basins (C28, C33, C34, C50, and C51) and was detected at a maximum concentration of 4900 µg/g in a sediment sample collected from catch basin C50 on May 5, 1989 (PAS-00023086). In addition, lead was also detected in soils collected outside the foundry building. Lead was detected at a maximum concentration of 7900 µg/g from sample 4b-2 at a depth of 0-6 inches bgs on May 1989 (PAS-00023061).

Mercury

Unlike copper and lead, the specific use of mercury in the pump process has not been identified. However, reports do state that the material was stored on site through 1992 in two of the manufacturing buildings and may have been used as part of the manufacturing operations (PAS-00023017). These buildings had roofs and concrete floors, and mercury was stored in a closed glass bottle or jug (PAS-00023610). In addition, unlike other metals, mercury was listed as being stored in Building 3 and 55, both of which are in the center of the Worthington facility (PAS-00022964; PAS-00023583). However, mercury was detected along the eastern property line at a maximum concentration of 35.4 µg/g from soil sample SP-2A collected at a depth of 0.5-1 feet (ft) below ground surface (bgs) in a February 1990 investigation (PAS-00023178). Mercury was also detected in other soil samples collected along the eastern property line, including the cooling tower sump and spray pond sump-1, 2, and 3 (PAS-00023178).

Surface water runoff at the Worthington Avenue facility was historically directed to the 54 catch basins located across the site, and water collected from these catch basins was discharged the PVSC (PAS-00023118).

Fifty-four catch basins were located on the Dresser Facility. During the course of the field investigations conducted in May 1989, each of these catch basins were cleaned out and inspected. Sediments from the most up-gradient and most down-gradient catch basins were analyzed for PCBs and metals. In addition, soils adjacent to the catch basins were also collected and analyzed for metals and PCBs (PAS-00023083). Mercury was detected in sediment samples collected from catch basins (C28, C33, C34, C50, and C51) and was detected at a maximum concentration of 11 µg/g in a sediment sample collected from catch basin C34 on May 5, 1989 (PAS-00023086). In addition, mercury was also detected in soils collected adjacent to the cracked catch basins and was detected at a maximum concentration of 6.20 µg/kg from sample C-40 at a depth of 1-3 feet bgs on June 16, 1989 (PAS-00023090).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[1]

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00023024; PAS-00023178; PAS-00023171).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	7,900 mg/kg
Copper	61,000 mg/kg
Mercury	35.4 mg/kg
Benzo(a)anthracene	104.44 mg/kg
Benzo(a)pyrene	148 mg/kg
Benzo(b)fluoranthene	122.64 mg/kg
Benzo(k)fluoranthene	54.352 mg/kg
Dibenzo(a,h)anthracene	11.24 mg/kg
Indeno(1,2,3-cd)pyrene	21.476 mg/kg

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Sanitary Sewer

As reported in the Response to CERCLA *Section 104(e) Request Letter*, dated December 2000, Dresser during the course of its manufacturing operations did not generate process waste water which contained any hazardous substances. Dresser affirms that they did not generate any process waste water. In addition, there were no floor drains in the manufacturing or production areas of any buildings. There were floor drains in the restroom areas of certain buildings, which were connected to the sanitary sewer system operated by the Passaic Valley Sewer Authority (PVSA) (PAS-00063877).

Dresser was permitted to send non-contact cooling water to the PVSC combined sewer, along with sanitary waste (PAS-00023326-27; PAS-00022954).

Storm Sewer

There was one cooling pond located adjacent to the Worthington Avenue facility's powerhouse. There were also storm sewers which discharged to numerous catch basins located at various locations at the Worthington facility. The catch basins were connected to the sanitary sewer system operated by the PVSA (PAS-00063877). The potential pathway from the facility to OU2 was via the various catch basins at the facility which discharged to the sanitary sewer system operated by the Passaic Valley Sewer Authority (PAS-00063878). , Samples from the catch basins were collected between 1989 and 1992. Lead, copper, mercury, PCBs and PAHs were detected in catch basin sediment samples and in some instances, these concentrations were detected at levels above the cleanup levels (PAS-00023084-90, 194, 212-214, 219-27).

Historic PVSC reports state that wastes were routinely bypassed from the PVSC main interceptor to the Passaic River at the Worthington Avenue CSO overflow location during wet weather events (PAS-00023485). The overflow may have been obstructed during 1976 and 2002. A *Response to the September 11, 2006 Notice of Potential Liability for Response Actions in the Lower Passaic River* (the EPA Notice), reported that the Worthington CSO outfall pipe was obstructed when examined in 1976 and 2002 (PAS-00124468). Reports referenced in the response to the EPA Notice state that flow was unable to be measured from the Worthington CSO to the Passaic River due to blockage and provided an estimated flow (PAS-00124468). A 1976 Overflow Analysis stated that the outfall was obstructed and full of debris and a 2002 report stated that the outflow pipe was not free flowing and flow was unable to be determined (PAS-00124468).

6. Regulatory History/Enforcement Actions

Permits

The facility was authorized to discharge treated groundwater back into the ground via an injection well under NJPDES/DGW Permit No. NJ7000821 effective December 31, 1995 and expiring December 30, 2000 as part of the groundwater remediation (PAS-00023265; PAS-00023628).

Permit No. 13402044 authorized the facility to discharge directly into the PVSC sewer system (PAS-00023275) and was set to expire in June 1991.

PVSC Sewer Connection Permit No. 13402043 authorized two outlets to the PVSC system. In February of 1990, the outlet designated as 2 was closed because it was dry (PAS-00023273). By the end of 1993, the site was inactive and the Permit No. 13402043was terminated (PAS-00023279, PAS-00023325-28).

Inspections and Violations

In the CERCLA *Section 104(e)* Request Letter, dated December 2000, Dresser stated that with respect to the approximate period of 1985 to 1993 at the Worthington Avenue facility, Dresser did not recall any civil, criminal, or administrative proceeding against the company for any such type of violation (PAS-00063880).

The *Response to CERCLA Section 104(e) Supplemental Report*, dated March 2003, which is included as an attachment within the *Indirect Discharge PRP Cases Volume II*, dated July 2006, noted that during the time period of approximately 1985 to 1993, Dresser did not recall any leaks, spills, explosions, fires, or other incidents of accidental material discharge at the Worthington facility (PAS-00121840).

The *Response to CERCLA Section 104(e) Supplemental Report, dated March 2003,* also states that Dresser did not recall any flooding occurring at the Worthington facility during the time period of 1985 to 1993. In addition, Dresser did not know whether any flooding occurred at the Worthington Avenue facility prior to 1985. However, Dresser notes that some minor flooding of the property occurred in or around July 24, 1995. The minor flooding was the result of several days of heavy rain storms. Dresser did not possess any information that would document that the flooding was the result of overflow from sanitary or storm sewer backup. The minor flooding was not due to flood overflow from the Passaic River (PAS-00121841).

There is one violation citing N.J.A.C. 7:26-9.4 (g) 8 et seq. – failure to conduct semi-annual drills. 9.6(f) 4 – failure to familiarize local hospitals with properties of hazardous waste handled onsite. 9.7(a) – failure to have a written contingency plan (PAS-00122350).

7. Response Actions

The following is a list of major response action documents identified in the available file material:

- Soil Delineation Report – UST East of Spray Pond, Dresser Worthington Pump Facility, Harrison, New Jersey, dated September 1994 (PAS-00023231);
- Investigation of Harrison Baking Company's Underground Gasoline Release and Its Impact on Dresser-Worthington Facility, Harrison, New Jersey, dated July 1992 (PAS-00023244);

- FEDCO/Worthington Solvent Area Groundwater Investigation, dated May 1995 (PAS-00122270);
- Catch Basins: “Area Q” Remediation Report, Dresser Worthington Pump Facility, Harrison, New Jersey, dated September 1994 (PAS-00122574); and,
- Addendum to the Remedial Action Report, Dresser-Worthington Pump, Harrison, New Jersey, ISRA Case No. 85034, dated June 2000 (PAP-00033677).

Characterization Activities

Sewer

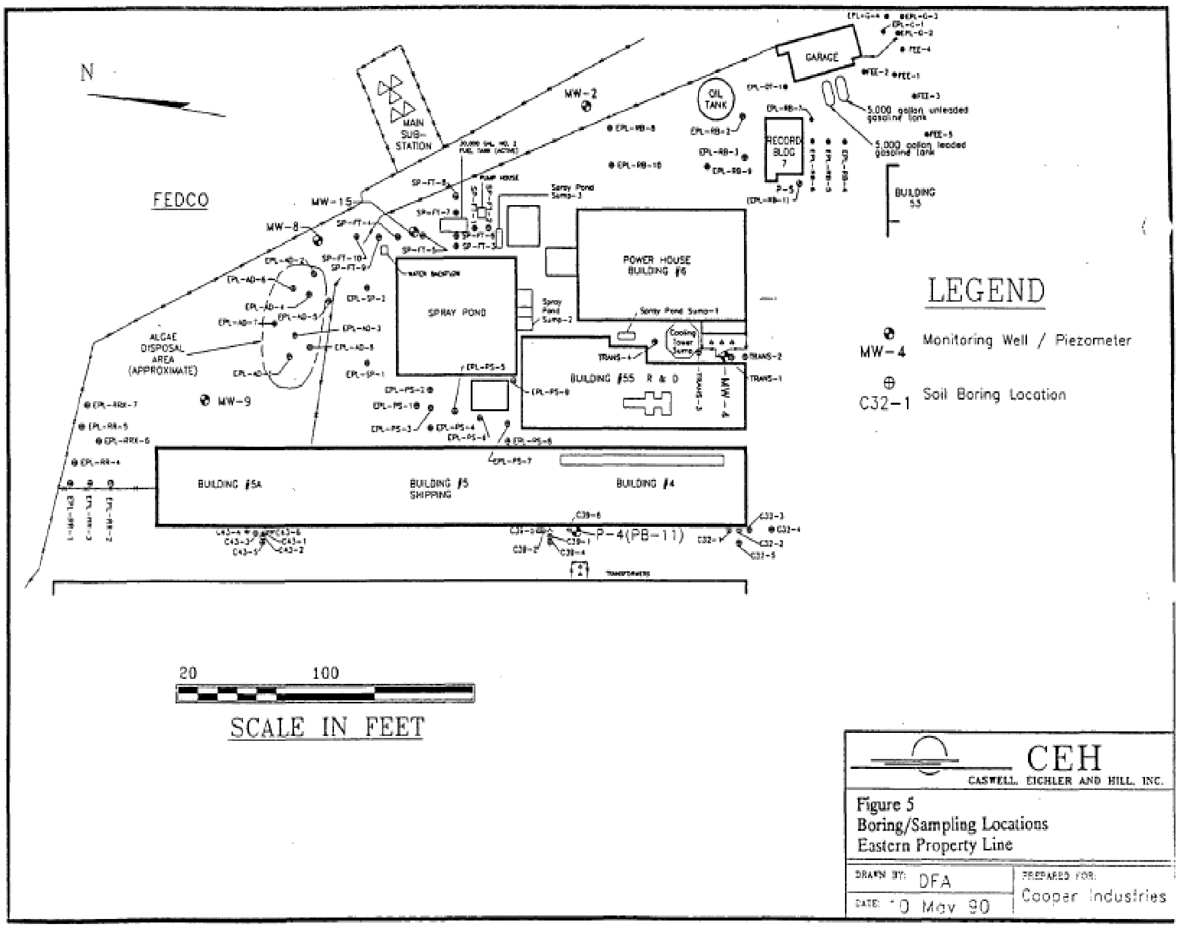
There is no information regarding sewer sampling in the available file material.

Soil

Reports state that there are three 30,000 gallon underground storage tanks that contained No. 2 fuel oil (PAS-00023039) and a 200,000 gallon aboveground tank that contained No. 6 fuel oil (PAS-00023541; PAS-00122235). There may have also been an additional two 5,000 gallon underground storage tank that contained No. 2 fuel oil. The exact amount of PAHs present in these fuel oils is unknown (PAS-00022963; PAS-00023035-36).

Site soil sampling conducted during Dresser’s tenure shows the presence of the following contaminants at the levels presented below:

- Copper up to 61,000 ppm; 4B-2 (PAS-00023024)
- Lead up to 7,900 ppm; 4B-2 (PAS-00023024)
- Mercury up to 35.4 ppm; EPL-SP-2A (PAS-00023178)
- Benzo(a)pyrene up to 148 ppm; EPL-RB-5A (PAS-00023171)
- Benzo(b)fluoranthene 122 ppm; EPL-RB-5A (PAS-00023171)



PAS-00023125

Sediment

Site sediment sampling conducted during Dresser's tenure showed the presence of the following contaminants at the maximum levels as listed below (PAS-00023482):

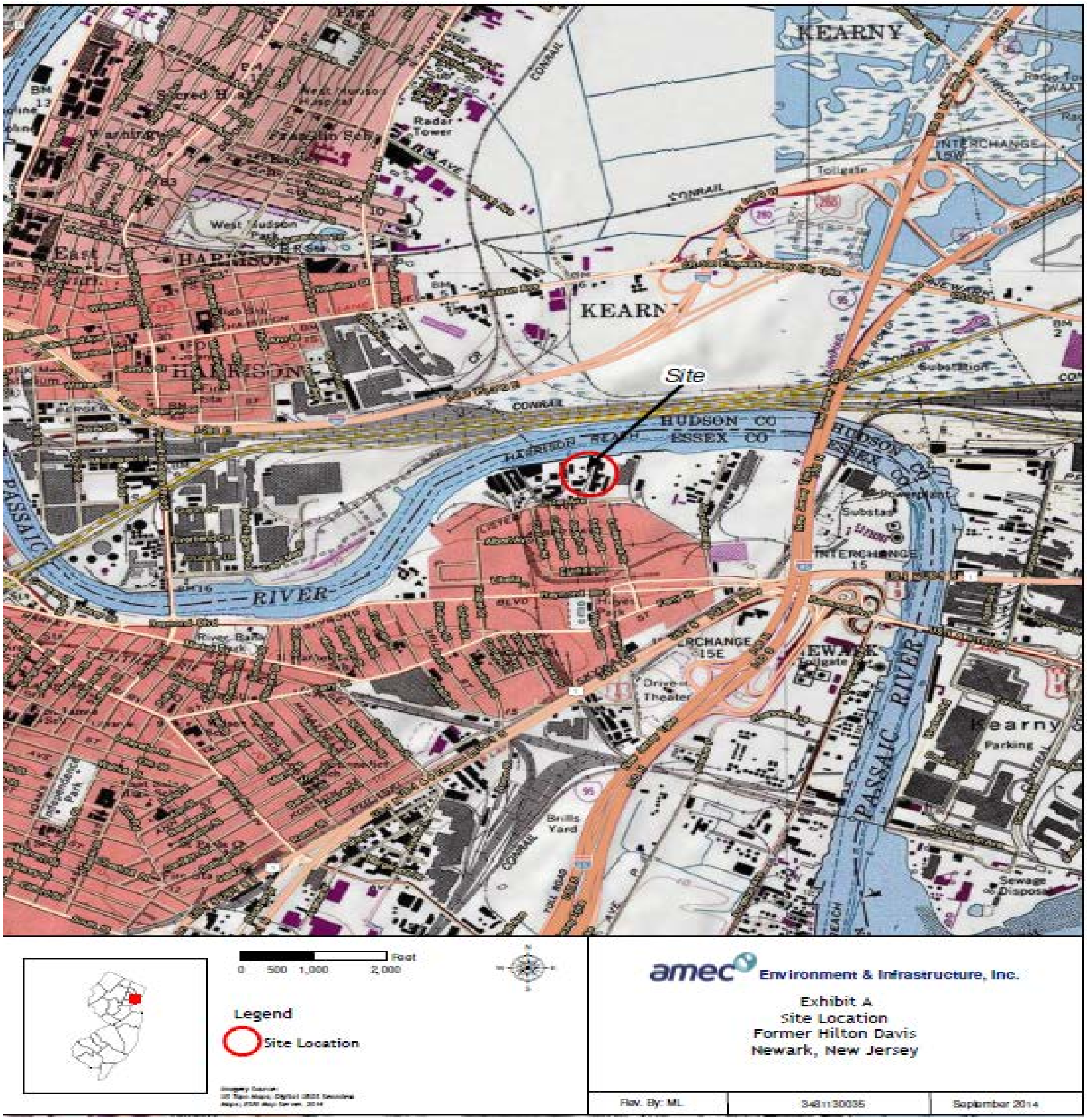
- Benzo(a)anthracene – 0.46 ppm; Catch Basin C-40 (PAS-00023214)
- Benzo(a)pyrene – 0.047 ppm; C-40 (PAS-00023212)
- Benzo(b)fluoranthene – 1.3 ppm; C-40 (PAS-00023212)
- Dibenz(a,h)anthracene – 0.25 ppm; C-40 (PAS-00023212)
- Indeno(1,2,3-cd)pyrene – 0.87 ppm; C-40 (PAS-00023212)
- Lead – 4,900 ppm; C-50 (PAS-00023086)
- Mercury – 11 ppm; C-34 (PAS-00023086)

8. Summary of Asserted Defenses

No legal defenses were identified in the available documents.

DRUM SERVICES OF NEWARK, INC.

Facility Name, Address and Size: Drum Services of Newark, Inc., (Drum Services); 120 Lister Avenue, Newark, New Jersey; 2.2 acres (PAS-00107863; PAS-00125787). The approximate location of the facility and its proximity to the Passaic River is shown in the map below.



(PAP-00195021)

Facility Data Report

1. **Business Type:** Drum refurbishing (PAP-00026394).

2. **Time Period of Ownership/Operations**

    Operator: May 1997 – approximately 2004
    Owner: May 1997 – 2008 (PAS-00055188-189; PAP-00057514).

    A *Supplemental Remedial Investigation Report (RIR)* states that in May 1996, Hilton-Davis ceased operations, and the property was sold to Drum Services in May 1997. From May 1997 to approximately 2004, Drum Services washed and painted steel drums for resale or crushed drums for recycling. Historical aerial photograph review indicated that a change in site use to tractor-trailer parking had occurred by 2006 (PAP-00057514). The current owner, Sydney Equities, LLC acquired the site in 2008 (PAP-00057514).

3. **Operational History/COC Use and Presence at the Facility**

    In May 1996, Hilton-Davis ceased operations at the facility. The property was sold to Drum Services in May 1997. The site had a brief period of vacancy between May 1996 and May 1997 (PAS-00055188-189; PAP-00057514).

    From May 1997 to approximately 2004, Drum Services washed and painted steel drums for resale or crushed drums for recycling (PAP-00057514). A NJDEP Site Inspection Report (May 17, 2001) conducted under ISRA Case No. E86941, states that Drum Service was a drum refurbishing company that washed and painted drums for resale or alternatively crushed and discarded drums (PAP-00026394).

    A Passaic Valley Sewer Commission (PVSC) Industrial Inventory shows that Drum Services at 104 Lister Avenue reconditioned steel drums and was deleted from the Inventory within the period of August 1, 2003 to July 31, 2004 (PAP-00097504). A Third Party Complaint notes that 120 Lister Avenue is also referred to as 104-12 Lister Avenue (PAP-00165397).

    Historical aerial photograph review indicated that a change in site use to tractor-trailer parking had occurred by 2006. The current owner, Sydney Equities, LLC acquired the site in 2008 (PAP-00057514).

4. **Identified COCs**

    There is no information regarding COCs in the available file material.

    Historic Fill

    The June 28, 1996, Deed Notice for the Facility includes Historic Fill PAHs and lead (PAP-00194956-972).

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

There is no information regarding fill materials in the available file material.

5. COC Pathways

No information was found in the available records regarding COC pathways during operation of the site by Drum Services. However, wastewater would have been generated in the process of washing drums and it likely would have included residues from whatever the drums contained.

6. Regulatory History/Enforcement Actions

Permits

No permits for Drum Services were identified in the available records. It should be noted that the facility was under a sewer use permit (No. 20402690) from May 15, 1981 through May 15, 1986 for discharge of effluent to PVSC. This permit was renewed by PVSC effective May 27, 1986 for five years (PAS-00002721). However, available references did not include copies of the permit indicating flow rate limitations and effluent monitoring requirements.

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[1]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Violations

Drum Services is listed as a company that was issued fines from PVSC during the August 1, 1997 to July 31, 1998; August 1, 1998 to July 31, 1999 and the August 1, 2000 to July 31, 2001 time periods (PAS-00017752; PAS-00021364). No additional information was provided in the files reviewed.

7. Response Actions

Available references did not provide information indicating whether Drum Services has ever been required to undertake Industrial Site Recovery Act (ISRA) or Environmental Cleanup Responsibility Act (ECRA) compliance activities.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Facility Data Report

ELAN CHEMICAL CO., INC.

Facility Name, Address and Size: Elan Chemical Co., Inc.; 268 Doremus Avenue, Newark, New Jersey; approximately 4 acres (PAP-00115558; PAS-00061331); In 1979, 62 employees working 5 days per week, 3 shifts per day (PAS-00014534).

1. **Business Type:** Development and manufacturing of food additives, flavorings, and ingredients for the food and beverage industry, and specialty chemicals (PAP-00115780; PAS-00061331).

2. **Time Period of Ownership/Operations**

Operator: December 30, 1977 to present
Owner: 1977/1983 to present (various lots as noted below)

1968: Elan Chemical Company, a Connecticut company (Elan-Conn), acquired the site from Essex Chemical Company in 1968.[1] (PAS-00059896-97; PAP-00115559; PAP-00115958)

1977: In September 1977, Felton International, Inc. organized the present Elan Chemical Company, Inc. (Elan) as a New Jersey subsidiary for the purpose of acquiring Elan-Conn. Elan acquired the main parcel of 268 Doremus Avenue from the New Jersey Economic Development Authority on December 30, 1977. Elan thereafter began its operations at the property (PAS-00059886, 96-97, 904; PAP-00115559).

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[1] According to Elan's Response to EPA's Request for Information, in May 1964 a corporation under the name Elan Chemical Company ("Elan-Conn") was incorporated under the laws of the State of Connecticut. Elan-Conn acquired the assets of another chemical company in 1964 and commenced business operations as a manufacturer of chemicals in Springdale, Connecticut. In 1968, Elan-Conn qualified to do business in New Jersey and began operating at the Doremus Avenue site. In 1971, the owners of Elan-Conn, via a tax-free "F Reorganization," organized a New Jersey corporation and liquidated Elan-Conn into the new New Jersey corporation. The effect of this reorganization was to convert Elan-Conn from a Connecticut corporation into a New Jersey Corporation ("Old Elan-NJ").
In September 1977, Felton International, Inc. ("FII"), a New York corporation doing business in Brooklyn, organized the present Elan Chemical Company, Inc. ("Present Elan") as a New Jersey subsidiary for the purpose of acquiring Old Elan-NJ from its then-owners, Messrs. Herbert Halpern, Herman Kaplan and Harold Kwart. The acquisition was effected via a complex transaction designed to provide for the availability of New Jersey Economic Development Authority ("E.D.A.") financing for a portion of the assets to be acquired. Present Elan was originally incorporated by FII under the name Elan Acquisition Corporation. The acquisition transaction was comprised of a series of steps, which were all concluded on the same day:
1. First, Elan Acquisition Corporation (as a subsidiary of FII) purchased 56% of the shares of Old Elan-NJ and the E.D.A. purchased the remaining 44% of the shares. E.D.A. paid for its shares by issuing E.D.A. bonds to the sellers.
2. Then, Elan Acquisition Corporation and E.D.A. immediately liquidated Old Elan-NJ, with the real estate and tangible depreciable assets of Old Elan-NJ being distributed to E.D.A. and the remaining assets of Old Elan-NJ being distributed to Elan Acquisition Corporation.
3. Then, all of the real estate and tangible depreciable property received by E.D.A. on the liquidation was sold to Elan Acquisition Corporation for an amount equal to the face amount of the E.D.A. bonds issued to the sellers.
4. Elan Acquisition Corporation, after the foregoing series of steps, acquired all of the assets of Old Elan-NJ, and the sellers held E.D.A. bonds having a value equal to the value of the corporation's real estate and tangible depreciable property.
5. Elan Acquisition Corporation then changed its name to Elan Chemical Company, Inc. (referred to above as Present Elan). (PAS-00059896-97).

1983: On April 24, 1983, Elan acquired a second parcel from Consolidated Rail Corporation. Since 1983, the Elan facility has consisted of both parcels of property that currently make up 268 Doremus Avenue (PAS-00059886, 909; PAP-00115559).

It is noted that the property also contains an approximately 12,000-square-foot building formerly leased by Natural Flavors, Inc., which lies in the northeast corner of the site and consists of a single-story warehouse and production facility. Natural Flavors, Inc. was a flavor compounding facility that leased the facility from January 1986 to January 2019. (PAP-00115916).

3. Operational History/COC Use and Presence at the Facility

The facility is used for the development and manufacturing of food flavor ingredients, and other aromatic chemicals. Various catalysts and processing aids are typically utilized in the manufacturing process (PAS-00059887).

According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, the property is improved with a variety of structures which include office space, warehouses, processing facilities, aboveground storage tank farms within concrete-lined and walled secondary containment, a site water treatment facility, site runoff management floor drains and sumps with associated hoses and overhead piping, as well as material storage drum racks, and shipping and receiving areas (PAP-00115916).

The manufacturing process is a batch process and typically consists of three major steps:

1. Reaction: During the reaction step the raw materials, catalysts and processing aids (solvents, etc.) are loaded into a reactor. Typically, heat is applied for a period of time during which the reaction mixture is agitated.

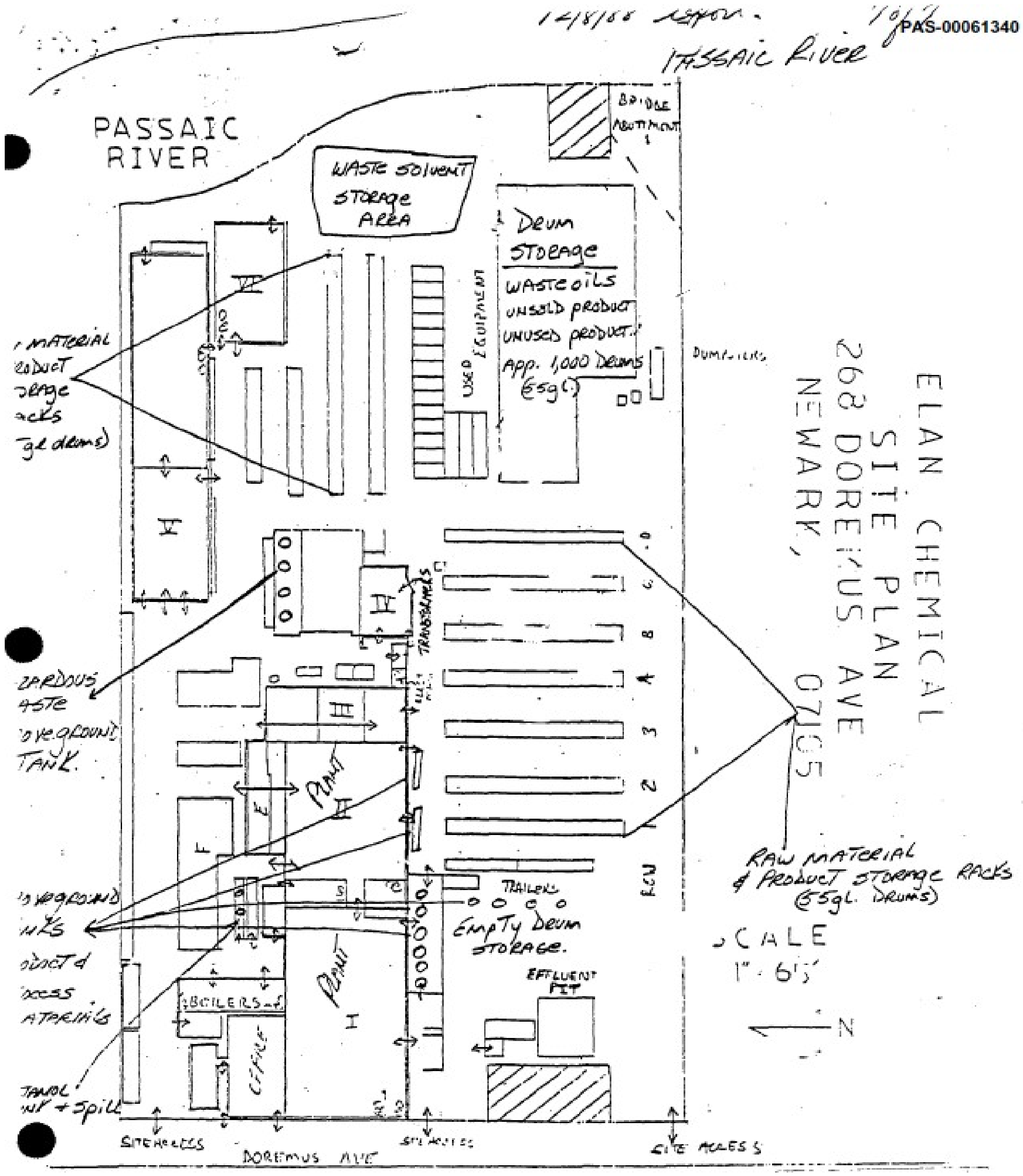
2. Washing: At the end of the reaction step the reaction mixture is typically washed with water or a mildly caustic solution to remove the un-reacted acids. This is accomplished in the reactor or a wash tank.

3. Purification: Purification is typically achieved by vacuum distillation. During this step the solvents and unreacted raw materials are removed from the reaction mixture, thereby isolating the finished product. This is accomplished in specially equipped distillation stills. The recovered solvents are reused until they are degraded. After purification, the finished product is drummed and shipped to customers (PAS-00059887).

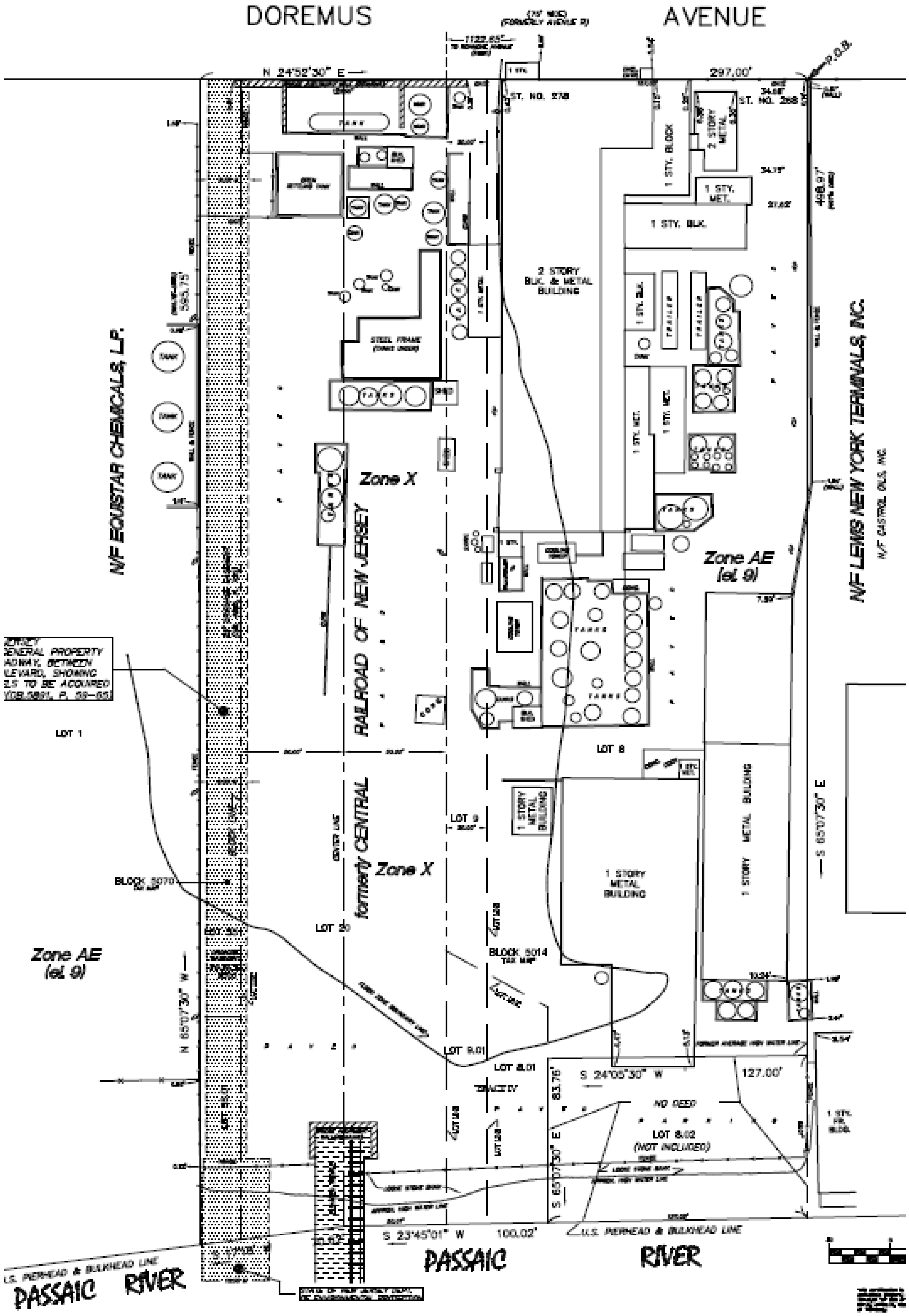
Based on review of Elan’s raw materials list included in their Response to Environmental Protection Agency Request for Information, dated February 16, 1995, with the exception of copper, no OU2 COCs are used in production (PAS-00059971-81).

Elan used copper shot and copper chromite from approximately 2002 to 2006. Copper was used solely as a structural component (reactor vessel body) for its heat transfer characteristics and chemical compatibility (catalyst). When the copper was no longer usable as a catalyst in the manufacturing process, it was sold as copper scrap. Copper powder has also been used in small amounts for research and stored in Elan's laboratory. The copper compounds are all in solid form (PAS-00059973).

An historical facility layout is depicted below (PAS-00061340):



The current facility layout is depicted below (PAP-00445831):



4. Identified COCs

- PAHs (used, detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

PAHs

According to a Community Right to Know Survey for 2014, the facility used diesel oil or No. 2 heating oil in the maintenance shop. A maximum daily inventory of 1,000 to 2,499 pounds was listed as being present (PAP-00115718).

According to a Community Right to Know Survey for 2015, the facility used diesel oil or No. 2 heating oil in the maintenance shop. A maximum daily inventory of 500 to 999 pounds was listed as being present (PAP-00115706).

According to a Community Right to Know Survey for 2017, the facility used diesel oil or No. 2 heating oil in the maintenance shop. A maximum daily inventory of 100 to 499 pounds was listed as being present (PAP-00115692).

PAHs were detected in soil as discussed in Section 7 below. According to a deed notice filed for the site on June 7, 2018, concentrations of PAHs at the site are typical of that in historic fill (PAP-00433512).

Copper

Elan used copper shot and copper chromite from approximately 2002 to 2006. Copper was used as a structural component (reactor vessel body) for its heat transfer characteristics and chemical compatibility (catalyst). When the copper was no longer usable as a catalyst in the manufacturing process, it was sold as copper scrap. Copper powder has also been used in small amounts for research and stored in Elan's laboratory since 1977. The copper compounds are all in solid form (PAS-00059973).

In 1979, copper was reported in wastewater at a concentration of 0.741 milligrams per liter (mg/L) (PAS-00014539).

In addition, copper was detected in soil at the site as discussed in Section 7 below. According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, previous environmental reports from 1992 and 2001 confirmed the presence of fill containing metals on the property (PAP-00115938).

Lead

There is no information regarding lead use by the facility in the available file material. However, in 1979, lead was reported in wastewater at a concentration of 0.111 mg/L (PAS-00014539).

In addition, lead was detected in soil at the site as discussed in Section 7 below. According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, previous environmental reports from 1992 and 2001 confirmed the presence of fill containing metals on the property (PAP-00115938).

Mercury

There is no information regarding mercury use by the facility in the available file material. However, mercury was detected in soil at the site as discussed in Section 7 below. According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, previous environmental reports from 1992 and 2001 confirmed the presence of fill containing metals on the property (PAP-00115938).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[2]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[3] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[4] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[5]

According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, previous environmental reports from 1992 and 2001 confirmed the presence of fill on the property (PAP-00115938). According to a deed notice filed for the site on June 7, 2018, concentrations of PAHs at the site are typical of that in historic fill (PAP-00433512).

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[2] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

[3] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[4] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[5] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00060200; PAP-00115569).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	1,120 mg/kg
Copper	1,370 mg/kg
Mercury	2.07 mg/kg
Benzo(a)anthracene	17.1 mg/kg
Benzo(a)pyrene	21.6 mg/kg
Benzo(b)fluoranthene	21.9 mg/kg
Benzo(k)fluoranthene	17.8 mg/kg

5. COC Pathways

According to a *Stormwater Pollution Prevention Plan* dated May 2014, in the general region in which Elan is located, precipitation runoff generally runs to the Passaic River, to the east. Elan is located adjacent to the west bank of the Passaic River (PAP-00433517). As stated below, precipitation runoff (stormwater) is retained on-site within secondary and tertiary containment, and remains within the facility's drains, catch basins, sumps, trenches, and underground conduits unless it is pumped by manual activation of pump controls to the facility's physical wastewater pretreatment unit for conveyance to an off-site industrial wastewater treatment plant (PAP-00433517-18).

Sanitary Sewer

<u>Wastewater Discharges</u>

According to Elan's Response to Environmental Protection Agency Request for Information, dated February 16, 1995, since at least 1977, the date of Elan's organization, the process wastewater stream from the facility has been connected to a sanitary sewer system (PAS-00059890).

In December 1979, Elan filed a Passaic Valley Sewerage Commission (PVSC) Sewer Application Permit. According to the permit, wastewater discharge was continuous over a 24-hour period, and wastewater was discharged to the sanitary sewer only. In 1979, no pretreatment was required (PAS-00014536).

Historically, the manufacturing effluent discharged into a cistern on the north side of the property and then directly to the PVSC system until approximately 1985, according to the *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016. In 1985, Elan installed a separate pre-treatment facility for the manufacturing effluent. The former effluent conveyance pipe was sealed in 1985, and the cistern tank was filled with sand (PAP-00115933; PAS-00061127).

From 1986 through approximately December 1991, the pretreatment process consisted of aeration and pH adjustment. In January 1992, extraction with "Isopar H" to remove organics was added to the pretreatment process (PAS-00059890).

According to the *Stormwater Pollution Prevention Plan* dated May 2014, sanitary and industrial wastewater related to facility operations are collected within the facility and are conveyed to the facility's wastewater pre-treatment unit, which then discharges to a sewer that transports this wastewater to a permitted off-site wastewater treatment plant. The document states there are no discharges of non-stormwater to surface waters, or to groundwater at Elan (PAP-00433518).

The *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, also states that runoff from facility operations is treated in the on-site effluent sump, which is part of the wastewater treatment system which Elan operates (PAP-00115932). It goes on to state the facility has an "extensive" network of concrete-lined surface drains and sumps which collect process spillage, precipitation, and wash down liquids which are conveyed by pumps through hoses or aboveground piping to a concrete-lined effluent sump where the water is tested, treated, and then discharged to the sanitary sewer system. The document states that Elan maintains a New Jersey Pollution Discharge Elimination System (NJDPES) permit to operate the on-site treatment system (PAP-00115931).

<u>Stormwater Discharges</u>

During an inspection of Elan by the NJDEP in December 1988, inspectors noted all drains, internal floor and outside stormwater, are connected to an effluent pit located on the southwest corner of the property. The effluent pit generates a discharge to PVSC (PAS-00061336).

According to a letter prepared by legal counsel for Elan, dated August 5, 1992, in 1992, a new sump was installed in the northeast portion of the site to collect stormwater runoff. The letter states the sump would be connected with "an existing line" which, since 1985, had routed stormwater runoff through the on-site pre-treatment facility prior to discharge to the PVSC system. The letter states that a surface drain which collects stormwater runoff also is located in approximately the center of the property (PAS-00061126-27).

According to the *Stormwater Pollution Prevention Plan* dated May 2014, the facility includes a discharge valve located in a drain at the northeast corner of the facility that is capable of conveying stormwater to the Passaic River. However, the document states this drain is in the locked position at all times and is not used for any stormwater discharge. The document states stormwater is retained on-site within secondary and tertiary containment, and remains within the facility's drains, catch basins, sumps, trenches, and underground conduits unless it is pumped by manual activation of pump controls to the facility's physical wastewater pretreatment unit for conveyance to an off-site industrial wastewater treatment plant. If accumulated stormwater needs to be removed from any point from Elan's facility, it is only pumped to the wastewater pretreatment unit after "it is first checked and verified to be free of oil and hazardous substance spillage." Pumps at drainage collection points are activated only manually to direct accumulated stormwater to Elan's on-site pre-treatment system prior to discharge to the PVSC industrial wastewater treatment system (PAP-00433517-18).

Direct Release

A December 1988 NJDEP inspection report states that though "there is not a point source discharge for Elan into the Passaic River… there is a possibility that surface runoff discharges into the Passaic River" (PAS-00061351). A prior December 1988 NJDEP inspection noted no evidence of discharge along the Passaic River bank (PAS-00061337).

As noted above, according to a *Stormwater Pollution Prevention Plan* dated May 2014, the facility includes a discharge valve located in a drain at the northeast corner of the facility that is capable of conveying stormwater to the Passaic River. However, the document states this drain is in the locked position at all times and is not used for any stormwater discharge (PAP-00433517-18).

According to a letter prepared by Elan's legal counsel, dated July 10, 2017, a NJDEP inspection report dated June 14, 1990, documented a six-inch discharge pipe running from the Elan property directly into the Passaic River. The letter states that the property containing the pipe was not purchased until 1983 and was purchased from Consolidated Rail Corporation. It states that this pipe was never used by Elan and was neither connected to any Elan operation nor was this pipe used by Elan for stormwater control or discharge (PAS-00049352-53).

Spills

According to a *Phase I Environmental Site Assessment*, prepared for Elan, dated October 2016, a potential release was investigated in 1992 at a drum storage area on site. Impacts of "organic compounds" identified in the area were attributed to historical fill and resolved by installing an impermeable cap within the drum storage area. The presence of historical fill was confirmed in 1992 and 2001 (PAP-00115928, 38). Sampling data for the drum storage area is discussed in Section 7 below.

Floods

According to Elan's Response to Environmental Protection Agency Request for Information, dated February 16, 1995, on November 8, 1993, the facility was flooded by overflow from the Passaic River. The flood lasted approximately 5 hours. On December 11, 1992, the facility was flooded by overflow from the sanitary sewer system and overflow from the Passaic River. The facility was flooded for 3 days. In January 1988, the facility was flooded by the overflow from the Passaic River. The facility was flooded for 6 hours (PAS-00059892). It is not stated whether these floods resulted in the discharge of OU2 COCs from the facility to the Passaic River.

6. Regulatory History/Enforcement Actions

Inspections

During an inspection of Elan by the NJDEP in December 1988, inspectors noted that a drum storage area was sloped down into drainage depressions, which flowed to the Passaic River. The drum storage area contained approximately 1,000 drums of waste

oils, unused materials, and unsold product. Oil was observed to be leaking from the drums and evidence was found of past spills of other materials in the area. The inspection report states that "It is likely that contaminants on the ground surface reach the depression." It also states that "It should be noted that evidence (visual) depicting this scenario could not be seen along the river bank" (PAS-00061334-37).

The inspection also states that all drains, internal floor and outside stormwater, are connected to an effluent pit located on the southwest corner of the property. The effluent pit generates a discharge to PVSC (PAS-00061336). It is unclear if OU2 COCs were associated with the leaking drums. According to a figure in a NJDEP inspection report, the drums contained unsold and unused product and waste oils (PAS-00061340).

Violations

According to Elan's Response to Environmental Protection Agency Request for Information, dated February 16, 1995, on January 5, 1994, the PVSC filed suit against Elan alleging that Elan discharged pollutants in excess of the discharge limitations of its PVSC Permit No. 20403242 (PAS-00059893, PAS-00060847 et seq.). No OU2 COCs were alleged to be associated with these discharges (PAS-00060849-50).

Permits

Wastewater

In December 1979, Elan filed a PVSC Sewer Application Permit. According to the permit, wastewater discharge was continuous over a 24-hour period, and wastewater was discharged to the sanitary sewer only. In 1979, no pretreatment occurred or was required (PAS-00014536). Wastewater was discharged via one outlet and daily flow was reported to be 126,000 gallons per day (PAS-00014537). In 1979, copper was reported in wastewater at a concentration of 0.741 mg/L and lead was reported at a concentration of 0.111 mg/L (PAS-00014539).

Elan was first issued PVSC Sewer Connection Permit No. 20403240 on April 14, 1981. Elan was also issued a PVSC Sewer User Permit No. 20200064 beginning in 2001. The permit was renewed through present day. The permits apply to the same discharge point (PAS-00059952-64, 937-51, 922-36; PAP-00206026-69, PAP-00115739-60). Elan was required to monitor the discharges for lead with a maximum daily limitation of 690 and a maximum monthly average limitation of 320 (concentration units were not listed in the cited document) (PAS-00059926-30).

In 2016, a maximum daily discharge limit for copper was listed in the PVSC permit as 3.98 mg/L, and for mercury as 0.06 mg/L (PAP-00115746). Lead was listed at a maximum of 690 µg/L (PAP-00115748). The permit also states that Elan was permitted to discharge 0.089 million gallons per day (PAP-00115742).
According to a *Phase I Environmental Assessment*, dated October 1992, the facility discharged between 60,000 to 70,000 gallons/day of treated wastewater (PAS-00061069).

Stormwater

According to a *Stormwater Pollution Prevention Plan* dated May 2014, Elan has a Basic Industrial Stormwater General Permit (No. NJ0088315), which became effective February 1, 2013. The permit governs the discharge of any stormwater from the Elan site to surface water and groundwater (PAP-00433517). The permit was renewed on February 1, 2018 (PAP-00115831). No monitoring for OU2 COCs was required under the permit (PAP-00115836-48).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- *Sampling Results Report*, dated April 1, 1992 (PAS-00060189);
- *Remedial Action Report*, dated June 2018 (PAP-00115556).
- *Response Action Outcome*, dated January 2020 (PAP-00445864)

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

According to Elan's Response to Environmental Protection Agency Request for Information, dated February 16, 1995, in or about the summer of 1989, certain drums (some determined to contain hazardous substances) stored in a then-unpaved gravel area of the property, were determined by the NJDEP to have corroded and leaked. NJDEP required a delineation of the contamination in this area (PAS-00059891-92).

According to a letter prepared by Elan's legal counsel, on July 26, 1990, NJDEP conducted a site inspection, and recommended that Elan conduct pre-excavation sampling to determine whether areas of soil staining were contaminated with hazardous or toxic substances. On December 11, 1990, an initial soil sample was collected from the zero to six-inch interval biased toward the most visually contaminated area (PAS-00060168-69). PAHs and metals were detected as follows:

- Chrysene – 14,300 J µg/kg
- Benzo(a)pyrene – 3,900 J µg/kg
- Indeno(1,2,3-cd)pyrene – 3,180 J µg/kg
- Copper – 137 mg/kg
- Lead – 935 mg/kg
- Mercury 2.07 mg/kg (PAS-00060175, 79).

According to a *Sampling Results Report*, dated April 1, 1992, soil samples were collected on March 25, 1991, to screen three visually stained areas at the former drum storage area for contamination. Samples were collected from 1.5 to two feet below ground surface (PAS-00060191, 94). Mercury was detected at a maximum concentration of 1,130 µg/kg (PAS-00060199). PAHs (in units of µg/kg) were detected at the following maximum concentrations in a background sample collected at zero to six inches as follows (PAS-00060200):

Benzo (a) anthracene	17100
Chrysene	16400
Benzo (b) fluoranthene	21900
Benzo (k) fluoranthene	17800
Benzo (a)pyrene	21600
Indeno (1,2,3-cd) pyrene	ND
Benzo (a,h) anthracene	ND

According to the report, Elan's consultant concluded that PAH detections in the former drum storage area were characteristic of the poor quality urban fill material used to reclaim the land from the former tidal marsh that the site is located on. In addition, ash, cinders, and decomposed brick were observed throughout the borings as in the previous sampling episode (PAS-00060195-96).

According to the *Remedial Action Report*, dated June 2018, the following maximum concentrations of copper and lead were detected in surface soil in the drum storage area (the PAH data reported are the same as those discussed in the paragraph above):

- Copper – 1,120 mg/kg
- Lead – 1,370 mg/kg (PAP-00115569).

Remedial Activities

A letter report summarizing results of soil sampling of the former drum storage area described above was sent to NJDEP on April 2, 1992 (PAS-00060762). Following the sampling, a Memorandum of Agreement was executed between Elan and NJDEP on August 8, 1992, requiring that the area of the former drum storage area be capped with asphalt (PAP-00115562). According to correspondence between Elan and NJDEP dated January 6, 1993, Elan had capped the property and requested that NJDEP terminate the Memorandum of Agreement (PAP-00115565; PAS-00060777).

A *Remedial Action Report*, dated June 2018, was prepared to support a restricted use, NJDEP "Area of Concern Response Action Outcome" for the drum storage area. The report addressed soil in the former drum storage area containing PAHs at concentrations greater than NJDEP Residential and Non-Residential Soil Remediation Standards. The report provided the basis to establish a site-wide deed notice with remedial action permit for historic fill (PAP-00115558). According to the report, the Passaic River is less than 100 feet from the former drum storage area, but the former drum storage area has not impacted Passaic River due to its "relatively low PAH concentrations, which are typical of historic fill," as well as the fact that the drum storage area had been capped (asphalt cover) since 1992. The remainder of the Elan property also is covered by buildings, asphalt, or concrete pavement (PAP-00115565).

According to a deed notice filed for the site on June 7, 2018, soil at the site contains concentrations of PAHs [namely benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene] at concentrations above the New Jersey Department of Environmental Protection Residential Direct Contact Soil Cleanup Criteria. It states that concentrations of contaminants of concern are typical of fill. In addition, it notes that soil impacted with lead in the drum storage area had been removed as a part of asphalt placement. Finally, it notes the site is completely covered with building foundations and asphalt, both of which will act as the engineering control for this area (PAP-00433512). A NJDEP Soil Remedial Action Permit was subsequently issued for the site on April 25, 2019, which establishes the monitoring and maintenance requirements for the engineering control described in the deed notice (PAP-00433487).

8. Summary of Asserted Defenses

CERCLA. 42 U.S.C. §9607(j) prohibits recovery for CERCLA response costs or damages resulting from federally permitted releases. All wastewater discharges from the Elan Facility were federally permitted discharges pursuant to valid permits (i.e. PVSC, Stormwater, etc.).

With respect to PAHs, should there be any allegations of a discharge, which there was not, Elan asserts the petroleum exclusion would exempt all PAHs alleged to be found at Elan's facility. 42 U.S.C. § 9601(14).

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

ENPRO HOLDINGS, INC

Facility Name, Address and Size: EnPro Holdings, Inc., previously known as Colt Industries Inc. and Coltec Industries Inc., which has assumed liability for Crucible Steel Corporation (Crucible Steel). There are two properties formerly owned and operated by Crucible Steel: 1) the western property located at 900-1000 South Fourth Street (now known as Frank E. Rogers Boulevard), Harrison, New Jersey, known as the Guyon property, and 2) the eastern property located at 600 Cape May Street, Harrison, New Jersey, known as the Spiegel property.

The Guyon and Spiegel properties are approximately 48 acres and 14.84 acres, respectively (PAP-00031286; PAP-00030677). There was a roadway approximately 50 feet wide and an open area approximately 75 feet wide separating the properties and the Passaic River (PAS-00083092). Crucible Steel employed 13,000 workers at the properties during World War II, which was reduced to 950 workers post-World War II. An additional reduction to 244 workers occurred during the period between 1960 and 1970 (PAP-00027916).

1. **Business Type:** Steel manufacturing and arms production (PAP-00028062).

2. **Time Period of Ownership/Operations**

Operator: Guyon property – July 25, 1900 to 1947; Spiegel property – 1938 to May 30, 1973

Owner: Guyon property – July 25, 1900 to 1947 and 1967; Spiegel property – July 25, 1900 to April 9, 1974

1900: Crucible Steel acquired the property in 1900 as part of the merger transaction that created Crucible Steel. Crucible Steel acquired additional property over time, including 20 acres in 1917. Crucible Steel operated Atha Works steel mill at the Guyon property from 1900 until 1947 (PAP-00361904).

1938: Crucible Steel operated the British Shell Shop during World War II on the Spiegel property (PAP-00361904).

1947 and 1967: Crucible Steel sold 38 acres of the Guyon property to Charles F. Guyon, Inc. in 1947 and sold the additional 7 acres to Charles F. Guyon, Inc. in 1967 (PAP-00027918).

1949 - 1973/1974: Crucible Steel operated its Spaulding Works steel rolling mill at the Spiegel property (PAS-00048071).

1974: Crucible Steel sold the Spiegel property to Spiegel Trucking, Inc. (PAP-00027917-18).

1999: On July 12, 1999, BFGoodrich completed a merger with Coltec Industries, Inc. by exchanging 35.5 million shares of BFGoodrich common stock for all of the common stock of Coltec Industries Inc. (PAS-00129265-66).

2007 - 2012: The Harrison Redevelopment Agency conducted demolition and remediation concurrently at the Spiegel property (PAP-00030699).

2016: Coltec Industries, Inc. underwent internal corporate restructuring on December 31, 2016, that resulted in the transfer of assets and certain liabilities and obligations to a newly formed entity, EnPro Holdings, LLC and a merger of Coltec Industries Inc. with OldCo, LLC (PAS-00048491-92).

3. Operational History/COC Use and Presence at the Facility

Guyon Property

Structures/activities at the Guyon property under Crucible Steel ownership/operations included furnaces (crucible, open hearth, electric arc, heat treating, annealing, and tempering furnaces), mills (rolling mills, bar mills, a wire rod mill, and a billet mill), presses (hydraulic and hydraulic forging, drawing, and piercing presses), hammers (steam hammers and a hammer shop involving forging and finishing hammers), upsetting and forging machines, foundry equipment, a forge shop, a warehouse, a low pressure turbine system, an inter-mill railroad line, a steel pickling plant, a chipping building, a machine shop, a gun barrel shop, a tin shop, a treating building, a pipe cutting and fitting building, a hydraulic plant, a substation, an ordnance shop, a locomotive and machine repair shop, a magnet foundry, storage buildings, a reservoir, above-ground oil storage tanks, an offices and laboratories building, and a research building (PAS-00048071). According to the *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001, there was a 10-inch oil pipeline along the eastern portion of the Guyon property based on the 1950 Sanborn Fire Insurance Map (PAP-00027960).

The 1943 Moody's Manual of Investments stated that the Atha Works (which was located on the Guyon property) included seven Heroult arc-type electric furnaces and one induction-type electric furnace (180,000 net tons of ingots); 11 forging and finishing hammers (1 ton to 8 tons); 15 steam hydraulic and hydraulic forging, drawing, and piercing presses (120 tons to 2,000 tons); four bar mills; one wire rod mill; one billet mill; heat treating and annealing furnaces; upsetting and forging machines; foundry equipment; machine tools; and, other finishing and incidental equipment. Finished products included bars, rods, forgings, etc. and ordnance materials (PAP-00028034).

According to the *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001, site plans were destroyed over the years, so little information is available regarding the site plans and facilities during the ownership/operation by Crucible Steel (PAP-00027961). However, the following information regarding site features for the Guyon property was available in the file material:

- A small reservoir or tank was located in the eastern-central portion of the Guyon property during 1940. Three small vertical tanks were also located in this area during this timeframe (PAP-00028017).

- A drainage outlet into the river was located in the southeast corner of the Guyon property, but no surface drainage leads to this area, and a retaining wall separates the outlet from the rest of the property. The drainage outlet may be a sewer or other underground liquid outlet (PAP-00028017).

- An area of disturbed ground and piles of unidentified material extended from the retaining wall to the southeast and into the river (PAP-00028017).

- A small complex of horizontal tanks was located east of South Fourth Street, just north of the river (PAP-00028017).

The buildings at the Guyon property have had many different occupants in the 50 years prior to 2013, and were used mostly for metal and plastics manufacturing (PAP-00030251).

Spiegel Property

Structures/activities at the Spiegel property under Crucible Steel ownership/operations included production of ordnance for the British government at the British Shell Shop starting in 1938, including barrels for large cannon, shells for such cannons, submarine periscope tubes, torpedo launching tubes, and rifle barrel steel. Metal working as Spaulding Works starting in 1949, producing cold rolled alloy, stainless, and high carbon steel specialties, including magnets, precision castings, cast alloy tools, and alloy welding rods (PAS-00048071). According to the *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001, site plans were destroyed over the years, so little information is available for the Crucible Steel site plans and facilities (PAP-00027961). However, the following information regarding site features was available in Appendix F of the *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001:

- Three steel 150,000-gallon capacity water tanks and associated piping, present along the northern boundary of the Spiegel property from the late 1930s to the late 1980s. Approximately 580 feet of 2.5-inch diameter piping extended to two furnaces at Building No. 98 (PAP-00028005-06).

- Nine steel 1,000-gallon capacity oil tanks at Building No. 138, present along the northeastern portion of the Spiegel property from after 1940 to approximately 1998 (PAP-00028006). However, an Aerial Photograph Review appendix does not include the nine tanks in a 1953 aerial photograph description; while the description of the 1961 aerial photograph does, so it is unclear when the tanks were first present (PAP-00027999-28000). The 1953 aerial photograph is missing from the file material as only the aerial photographs for 1940, 1961, and 1974 were included in the document.

- Three steel 275-gallon capacity waste oil tanks of unknown age at the northern end of the Spiegel property east of Building No. 54 (PAP-00028006). The tanks were identified adjacent to an automotive repair operation during a site inspection and held automotive fluids (PAP-00028007).

- One steel 550-gallon capacity tank of unknown age at the northern end of the Spiegel property east of Building No. 54 (PAP-00028007).

- One steel 275-gallon capacity tank of unknown age at the northern end of the Spiegel property east of Building No. 138 (PAP-00028007-08). The tank was identified adjacent to an automotive repair operation during a site inspection (west of Building 54) and held spent automotive fluids (PAP-00028008).

- One underground storage tank (UST) of unknown age and unknown size and material, assumed to be located at the northern end of the Spiegel property west of Building No. 138 based on the presence of a fuel dispenser pad (PAP-00028008).

- Former transformer present from the late 1940s to the early 1980s and located in the southwestern portion of the Spiegel property, assumed to have contained polychlorinated biphenyls (PCBs) based on the age (PAP-00028010-11).

- Former transformer present in the mid-1940s located south of Building No. 97, assumed to have contained PCBs based on the age (PAP-00028011).

Minor on-site incidents involving oily substances were discovered as part of the investigation related to a 1970 discharge of oily material (see Section 5, COC Pathways discussion below for more details regarding the 1970 discharge). Although the oily material was determined not be from Crucible Steel, several corrective actions were taken by Crucible Steel at the Spaulding Works facility:

- Prohibited the steam cleaning of equipment near manholes (PAS-00083106). Employees had been steam cleaning mobile equipment in the vicinity of some manholes (PAS-00083095).

- Stopped placement of waste oil into a pit near a surface drain (PAS-00083106). Employees were dumping waste oil into a pit which had previously contained a fuel storage tank and that was located near a surface drain (PAS-00083095).

- Sealed off an oil discharge from a pump used in Crucible Steel's hood annealing operation (PAS-00083106). The pump was discharging oil into a pit. The oil was collected in metal drums after the discharge was sealed off (PAS-00083095).
- Re-routed a drain line from the roll grinding operation away from a surface drain and into a holding reservoir (PAS-00083106-107).

Both Properties

Nitric acid and sulfuric acid, fuel oils, and rolling solutions/oils were used for operations. Rolling oils were spread on site as a dust abatement measure during the summer months, but this practice ceased after 1969 (PAS-00083094).

Chromium and nickel were constituents for the steel manufactured by Crucible Steel, and molten lead was used in quenching baths as part of the manufacturing process (PAS-00000914). During the quenching process, lead vaporized and as the vapors

cooled, lead oxide formed. The lead oxide was disposed of offsite as solid waste (PAS-00000914). The file material did not identify the quantities of lead oxide produced or discuss how lead oxide was handled/stored prior to disposal.

Some steel would go through acid treatment or pickling, which would result in dissolution of chromium, iron, and nickel. Steel was run through a water rinse following pickling, and rinse water may have contained “small quantities” of chromium, iron, and/or nickel. Rinse water was periodically discharged to the sanitary sewer system with no treatment until 1970 (PAS-00000914). According to an April 1, 2015, letter from Coltec to EPA, effluent from steel operations typically included de minimis concentrations of iron, chromium, lead, nickel, zinc, and other metals (PAS-00048071). The employees interviewed had no specific knowledge regarding the disposal of the liquids in the pickling baths. Raw acids were stored in stainless steel tanks (PAS-00000914-15). The 2015 letter also states that effluent from steel cold rolling operations typically included de minimis concentrations of iron, chromium, lead, nickel, zinc, and other metals, and lubricating and hydraulic oils (PAS-00048072). The file material did not identify the volume or frequency of discharges to the sanitary sewer system from Spaulding Works.

A figure of the property locations/extents and hand-drawn depiction of the discharge points are presented below (PAS-00083136):

EnPro Holdings

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

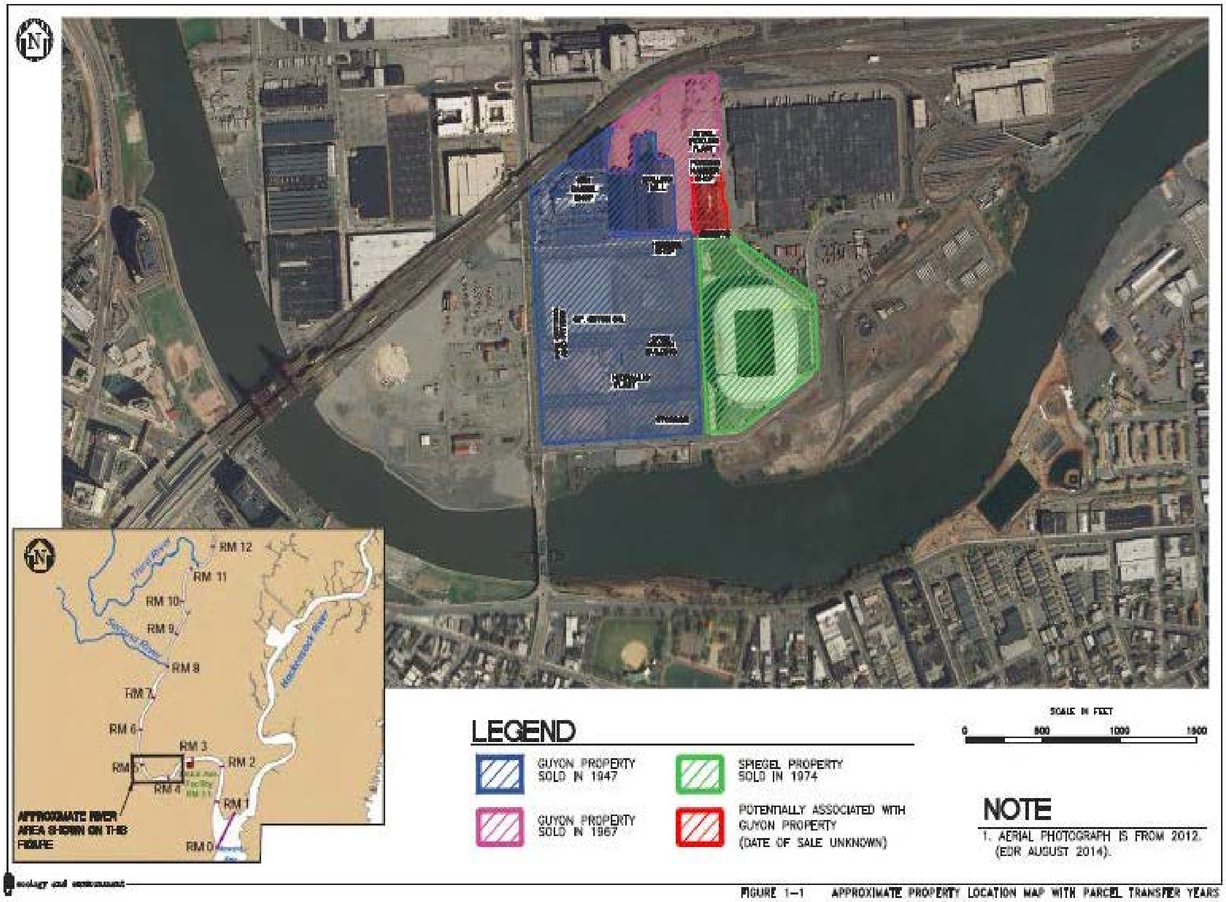
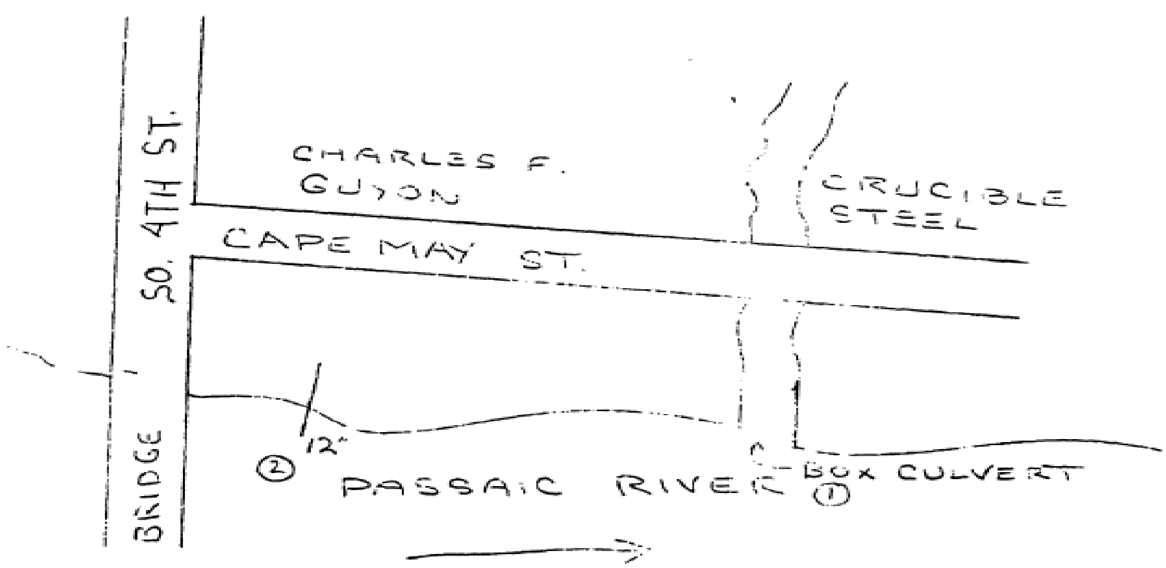


FIGURE 1-1 APPROXIMATE PROPERTY LOCATION MAP WITH PARCEL TRANSFER YEARS
PASSAIC RIVER LITIGATION STUDY
HARRISON, NEW JERSEY



4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Dieldrin (detected)
- DDx (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

PCBs were not manufactured or used by Crucible Steel and are not typically found in discharges from steel operations (PAS-00048071-72).

Guyon Property

Three Public Service Electric and Gas Company (PSE&G) transformers located along the east side of a paint shop at the Guyon property contained less than 50 parts per million (ppm) PCBs (PAS-00083226, 55). During the Industrial Site Recovery Act (ISRA) investigations in 2005, isolated "low-level" PCB soil contamination was detected at a railroad siding, a former oil tank location, and a former outdoor electrical substation (PAS-00048071).

Spiegel Property

During demolition for construction of Red Bull Stadium in 2007, concrete from several areas of the Spiegel property and sediment in one basement exceeded the New Jersey Department of Environmental Protection (NJDEP) Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) for PCBs (PAS-00048072). Concentrations of PCBs in two basement sediment samples ranged from 3.66 milligrams per kilogram (mg/kg) for Aroclor-1260 to 20.7 mg/kg for Aroclor-1254 (PAP-00028265). Concentrations of PCBs in basement water ranged from 13.1 micrograms per liter (ug/L) for Aroclor-1260 to 48.1 ug/L for Aroclor-1248 (PAP-00028309).

PAHs

PAHs may have been present in steel industry waste streams produced at both the Guyon and Spiegel properties.

Guyon Property

Results from the *Underground Storage Tank Remedial Investigation Report, Former Guyon General Piping Facility,* dated February 3, 1995, stated that all PAH concentrations were below method detection limits (PAP-00031082).

Spiegel Property

In 1970, the PVSC sent two cease and desist orders to Crucible Steel and filed a civil complaint due to the discharge of an oily waste to the Passaic River from the Spaulding Works through a box culvert (PAS-00083082-90). Samples collected at the outfall did

not contain sufficient quantities to identify the substance, which was described as having the appearance of fine number 2 type fuel oil or a mineral oil with a fine powdery or pulverized substance suspended in the oily material (PAS-00083093-94).

PAHs in soils at the Spiegel property were attributed to historic fill (PAP-00028108-110; PAP-00028527); however, PAHs were present in concrete at elevated levels with maximum concentrations as follows: benzo(a)anthracene-565 mg/kg; benzo(a)pyrene-294 mg/kg; benzo(b)fluoranthene-341 mg/kg; benzo(k)fluoranthene-255 mg/kg; dibenzo(a,h)anthracene-63 mg/kg; and, indeno(1,2,3-cd)pyrene-160 mg/kg (PAP-00028748-49).

Dieldrin

The soil and concrete sample results show sporadic detections and relatively low levels of dieldrin (PAP-00028777-793). No pesticides results could be located for the Guyon property in the file material.

DDx

The soil and concrete sample results show sporadic detections and relatively low levels of DDD, DDE, and DDT at the Spiegel property (PAP-00028777-793, 849). No pesticides results could be located for the Guyon property in the file material.

Copper

Copper may be present in steel industry waste streams. Based on investigations performed at the properties, copper detections are related to the historic fill (PAP-00028089).

Lead

During the quenching process, lead vaporized, and as the vapors cooled, lead oxide formed. The lead oxide was disposed of offsite as solid waste (PAS-00000914). The start date of lead quenching and the specific location of the quenching operations at the Spiegel property are both unknown, and the file material did not identify the quantities of lead oxide produced or discuss how lead oxide was handled/stored prior to disposal.

Mercury

Mercury is not an anticipated contaminant in steel industry waste streams. Based on investigations performed at the properties, mercury detections are related to the historic fill (PAP-00028089).

Historic Fill

The Allocation Team has determined that both the Guyon and Spiegel properties are located on regional Historic Fill as designated by the NJDEP.[1]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

It is also stated that, prior to 1940, all but the eastern edge of the Guyon property had historic fill (PAP-00028016). By 1940, several large areas along the eastern border of the Guyon property were filled with material of undetermined composition (PAP-00028017).

According to the *Phase 2 Site Investigation Report and Remedial Action Work Plan, Harrison Redevelopment Former Crucible Steel Site*, dated February 16, 2005, fill at the Guyon property ranges from two feet below ground surface (bgs) to 15 feet bgs and estimates the fill was placed prior to the late 1800s (PAP-00031288). This document also states that the fill was observed to be approximately 15 feet thick in the southern portion of the Guyon property and decreased to 10 feet thick in the central and northern portions of the property (PAP-00031292). According to the *Crucible Steel/Charles F. Guyon Complex Report*, dated August 30, 1996, the area east of the outlet into the river was filled and extended, enlarging the size of the property (PAP-00028020). No further information regarding this additional fill could be located in the file material.

According to the *Site Investigation Report/Remedial Action Work Plan*, dated February 1, 2002, at the Spiegel property, fill ranges in depth from five feet bgs along the southern portion of the property to 10 feet bgs along the central and northern portions of the property (PAP-00029345-46; PAP-00030296).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes in New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils		
COC	**Max Detected Concentration (Guyon Property)**	**Max Detected Concentration (Spiegel Property)**
Lead	3,710 mg/kg	72,800 mg/kg
Copper	432 mg/kg	7,900 mg/kg
Mercury	10.2 mg/kg	154 mg/kg
Benzo(a)anthracene	4.0 mg/kg	178 mg/kg
Benzo(a)pyrene	3.9 mg/kg	6.1 mg/kg
Benzo(b)fluoranthene	6.1 mg/kg	59.3 mg/kg
Benzo(k)fluoranthene	3.3 mg/kg	51.5 mg/kg
Dibenzo(a,h)anthracene	0.34 mg/kg	38.1 mg/kg
Indeno(1,2,3-cd)pyrene	1.1 mg/kg	43.9 mg/kg

5. COC Pathways

Groundwater underlying the Guyon and Spiegel properties may be in contact with river water given the close proximity of the properties to the river. Tidal influence was acknowledged by facility witnesses (PAS-00124662). A study of the water action states that as the tide came in, spots of oil from the river entered the outfall located at the Spiegel property, (PAS-00083130).

There were direct releases to the soil. Rolling oils were spread on site as a dust abatement measure, but this practice ceased after 1969 (PAS-00083094). According to the *Crucible Steel/Charles F. Guyon Complex Report*, dated August 30, 1996, roads and parking areas within the Guyon property were unpaved until after 1970 but were surfaced before 1979 (PAP-00028020).

Spiegel Property

Soil contaminants were determined to not be transported by overland flow since most of the Spiegel property was covered by asphalt or concrete (PAP-00030341).

According to the *Site Investigation Report/Remedial Action Work Plan*, dated February 1, 2002, groundwater seeps were not observed along the Passaic River during the site inspection (PAP-00030341). The *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*, dated October 9, 2007, discussed a tidal influence study that determined groundwater at the Spiegel property was not affected by tidal fluctuations in the Passaic River (PAP-00028065).

Sanitary and Storm Sewer

Guyon Property

During the 1970 discharge dispute, there were five laterals that ran from the Guyon property into the main storm draining system, located on the Spiegel property (PAS-00083095-96).

Spiegel Property

There are two outfalls to the Passaic River at the Spiegel Property: one at the 6-by-6-foot box culvert and the other was a 12-inch storm and cooling water sewer (PAP-00027919; PAS-00048071-72). The 12-inch outfall appears to be the same as the 12-inch diameter combined sewer and stormwater outfall adjacent to South Fourth Street, which served the Guyon property and which is referenced above.

During the 1970 discharge dispute, there were 16 known laterals running into the main storm draining system. Four of the laterals ran to the main from manholes on the Spiegel property, while the other 12 run into the main from points outside the Spiegel property (PAS-00083093). Five laterals ran into the main storm draining system from Charles F. Guyon (located at the Guyon property following sale by Crucible Steel); two laterals ran into the main from Miele Bros. Trucking Co.; one lateral ran into the main from Azco Steel Company; one lateral ran into the main from Gabest, Inc.; one lateral ran into the main from Prince Packaging Products, Inc.; and, two laterals ran into the main from Joseph Supor Trunking Co. (PAS-00083095-96).

Direct Release

The underground drainage system underlying the historical Crucible Steel facilities carried discharges of spent acid, water from equipment wash downs, and stormwater directly to the Passaic River through a 6-by-6-foot box culvert (PAS-00124662). No information regarding sampling of discharge for COCs could be located in the file material.

Guyon Lateral No. 1 was permanently closed on March 11, 1971 (PAS-00001023; PAS-00083118). The oil residue on the bank of the river was reduced following closure of Guyon Lateral No. 1 as evidenced by visual changes (PAS-00001023; PAS-00083119). A study of the water action stated that as the tide came in, spots of oil from the river entered the outfall, (PAS-00001024; PAS-00083130). A discharge sample collected on May 18, 1971, contained a chemical oxygen demand (COD) of 174 milliliters per liter (mL/L) (PAS-00083129). Information regarding the volume of discharge or the duration of the discharge could not be found in the file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material for the Guyon property:

- *Remediation/Decommissioning Results, Fabco Piping Inc.*, dated March 25, 1990 (PAS-00083210)
- *Sampling Plan Results and Cleanup Plan Addendum for Fabco Piping Incorporated*, dated December 14, 1990 (PAP-00030266)
- *Underground Storage Tank Remedial Investigation Report, Former Guyon General Piping Facility,* date February 3, 1995 (PAP-00031065)
- *Phase 2 Site Investigation Report and Remedial Action Work Plan, Harrison Redevelopment Former Crucible Steel Site*, dated February 16, 2005 (PAP-00031281)

The following is a list of major response action documents identified in the available file material for the Spiegel property:

- *Draft Preliminary Assessment Report, Harrison Redevelopment Spiegel Trucking, Inc.*, dated December 4, 2001 (PAP-00027937)
- *Site Investigation Report/Remedial Action Work Plan*, dated February 1, 2002 (PAP-00030289)
- *Site Investigation Report Addendum*, dated June 24, 2004 (PAP-00028383)
- *Groundwater Remedial Investigation Report*, dated July 29, 2004 (PAP-00028061)
- *Remedial Investigation Work Plan*, dated August 2005 (PAP-00028413)
- *Concrete Reuse Plan, Spiegel Trucking*, dated December 14, 2006 (PAP-00030393)
- *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*, dated October 9, 2007 (PAP-00028054)

- *Remedial Investigation/Remedial Action Report, 6th Street September 2006-September 2007, Netti Spiegel Trucking*, dated February 22, 2008 (PAP-00030469)
- *Remedial Action Work Plan Update, Netti Spiegel Trucking*, dated March 13, 2008 (PAP-00030624)
- *Interim Remedial Investigation Report II and Interim Remedial Action Report for January 2007-September 2007, Netti Spiegel Trucking*, dated May 28, 2008 (PAP-00028460)
- *6th Street Remedial Action Report Update, Netti Spiegel Trucking*, dated August 4, 2008 (PAP-00030694)
- *Remedial Action Report Addendum 6th Street Area during April 2009-August 2009, Netti Spiegel Trucking*, dated June 2010 (PAP-00030111)
- *Remedial Action Report - Soil, Former Netti Spiegel Trucking*, dated April 11, 2012 (PAP-00030870)

Sewer and Storm Drain Systems

Guyon Lateral No. 1 joined the central draining main approximately 150 feet west of the eastern boundary of the industrial complex and extended underground in a generally southerly direction beneath the Guyon property (PAS-00083107). Samples were taken from points in the drainage system within the boundaries of the Guyon property, and oil was found in samples collected July 15 and August 7, 1970, but was not found in samples collected after August 7, 1970. A fiberglass filter was kept in Guyon Lateral No. 1 between September 11 and 15, 1970, and collected a heavy concentration of oil (PAS-00083115). Temporary plugging of Guyon Lateral No. 1 occurred on November 30, 1970, and remained in place until January 7, 1971. While the temporary plug was in place, samples taken from the river outfall were clear of visible oil (PAS-00083108-109). Oily material had accumulated on the bank of the river at and near the outfall (PAS-00083110). Oil was present in the river itself upstream from the outfall on August 12, 1970 (PAS00083116). A discharge sample collected on May 18, 1971, contained a COD of 174 mL/L (PAS-00083129). This sampling information is from the court records related to the 1970 discharge dispute, but no analytical reports or other report of sampling results related to the sampling in 1970 and 1971 could be located in the file materials. It is unclear whether samples were analyzed for relevant COCs (i.e., PAHs, PCBs, and metals) as no information regarding analyses could be located in the file material.

Soil

<u>*Soil-Guyon Property*</u>

According to a *Remediation/Decommissioning Results, Fabco Piping Inc.*, dated March 25, 1990, soil samples were collected at the Guyon property on February 13, 1989, at three locations on the southeast side of a Paint Shop. Several metals exceeded New Jersey's Environmental Cleanup Responsibility Act (ECRA) guidelines, including copper at all three locations and mercury at one location (PAS-00083219-20).

The *Sampling Plan Results and Cleanup Plan Addendum for Fabco Piping Incorporated*, dated December 14, 1990, states that additional soil sampling was conducted at the Guyon property on October 2, 1990, along the perimeter of the paint shop. Lead was detected at levels ranging from 11.8 to 2,290 ppm at 18 to 24 inches bgs, and mercury results ranged from 0.264 ppm to 3.03 ppm at 42 to 48 inches bgs (PAP-00030272). This document also states that soil sampling was conducted at the sandblasting area on October 2, 1990 (PAP-00030274).

The *Underground Storage Tank Remedial Investigation Report, Former Guyon General Piping Facility,* dated February 3, 1995, describes soil sampling to investigate three USTs at the Guyon property (PAP-00031077). Samples were analyzed for total petroleum hydrocarbons (TPH) and PAHs, and all PAH results were below method detection limits (PAP-00031082-83). Based on a summary table provided in the report, it appears these tanks were 12 to +15 years old at the time of removal and/or in-place abandonment (PAP-00031071 and 74).

The *Phase 2 Site Investigation Report and Remedial Action Work Plan, Harrison Redevelopment Former Crucible Steel Site*, dated February 16, 2005, states that 38 soil borings were advanced during the Phase 2 Site Investigation (SI) (PAP-00031291). This document concluded that in general, soil contamination is associated with the presence of historical fill compounds (PAP-00031292).

<u>*Soil-Spiegel Property*</u>

According to the *Site Investigation Report/Remedial Action Work Plan*, dated February 1, 2002, soil samples were collected at the Spiegel property, and lead was determined to be associated with fill materials and not site operations (PAP-00030310).

As part of the *Site Investigation Report Addendum*, dated June 24, 2004, 53 soil borings were installed (PAP-00028063; PAP-00028383). The *Site Investigation Report Addendum* concluded that lead and copper exceedances in soil were consistent with the Historic Fill Database and were therefore related to historic fill (PAP-00028064; PAP-00028395).

The *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*, dated October 9, 2007, included 44 soils borings to investigate historic fill materials (PAP-00028081). Metallic slag was observed at three borings, and coal fragments/coal debris were observed at two borings (PAP-00028082). Soil samples were also collected from multiple areas of concern (AOCs) within the Spiegel property. Sampling of water and sediment within a basement, as well as sampling of concrete, were also conducted as part of the *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*. The *Interim Remedial Investigation Report, September 2006-December 2006, Netti Spiegel Trucking*, dated October 9, 2007, concluded that exceedances of PAHs, lead, and copper in soil were consistent with the Historic Fill Database and were therefore related to historic fill (PAP-00028108-110).

The *Interim Remedial Investigation Report II and Interim Remedial Action Report for January 2007-September 2007, Netti Spiegel Trucking*, dated May 28, 2008, included sampling of soil and concrete as well as interim remedial actions (see Remedial Activities discussion below for more detail regarding these actions). The *Interim Remedial Investigation Report II and Interim Remedial Action Report for January 2007-September 2007, Netti Spiegel Trucking*, dated May 28, 2008, concluded that exceedances of PAHs, and metals were consistent with typical historic fill (PAP-00028527).

According to the *6th Street Remedial Action Report Update, Netti Spiegel Trucking*, dated August 4, 2008, sampling of soil borings and test pits occurred at the Spiegel property. PAH and metals concentrations were consistent with typical historic fill (PAP-00030707-08, 12).

Remedial Activities

<u>*Guyon Property*</u>

According to a R*emediation/Decommissioning Results, Fabco Piping Inc.*, dated March 25, 1990, contaminated soil at the Guyon property was excavated and disposed from the exterior of a paint shop, stained soils were excavated and disposed from between railroad ties, and stained sediments were removed and disposed from the concrete floor of a lean-to that housed a No. 2 fuel oil aboveground storage tank (AST), located at the north end of the annealing and bending operations (PAS-00083217, 25-26). The excavation occurred on March 2, 1990, and removed soils/sediments were stockpiled on site prior to off-site disposal. No confirmation sampling was conducted following the excavation between railroad ties (PAS-00083225). According to the *Sampling Plan Results and Cleanup Plan Addendum for Fabco Piping Incorporated*, dated December 14, 1990, 70 tons of contaminated soil were excavated, and excavation extended to depths of 16 to 22 inches (PAP-00030271).

According to a R*emediation/Decommissioning Results, Fabco Piping Inc.*, dated March 25, 1990, sandblasting grit was scrapped up on October 31 and November 1, 1989, and stockpiled on site. Off-site disposal occurred on December 11 and 12, 1990 (PAS-00083227). The *Sampling Plan Results and Cleanup Plan Addendum for Fabco Piping Incorporated*, dated December 14, 1990, states that 579.1 tons of sandblasting grit was removed (PAP-00030274).

The *Underground Storage Tank Remedial Investigation Report, Former Guyon General Piping Facility,* dated February 3, 1995, states that four USTs were removed and three USTs were closed in place, but the dates of closure/removal are not specified (PAP-00031074). Based on the information provided regarding the age of the tanks, it appears they were all installed after Crucible Steel sold the Guyon property (1970s and 1980s). On January 3, 1995, 130 tons of contaminated soil was removed from the former location of UST 9, along with its associated piping. Excavation extended to a depth of 7 feet bgs in the area of the former tank and 3.5 to 4.5 feet bgs along the piping trench (PAP00031087).

Spiegel Property

According to the *Interim Remedial Investigation Report II and Interim Remedial Action Report for January 2007-September 2007, Netti Spiegel Trucking*, dated May 28, 2008, soil excavation and removal of concrete, as well as removal of product from shallow groundwater, occurred at the Spiegel property (PAP-00028513). Contaminated soil not characterized as historic fill was excavated and disposed of off-site, and confirmation sampling was conducted, which showed that concentrations were consistent with historic fill (PAP-00028513-20, 26). Removed concrete with exceedances above the NRDCSCC were disposed of off-site, while removed concrete with concentrations below the NRDCSCC was reused on site (PAP-00028519).

The removal of a UST containing 1,500 gallons of oily water occurred on September 6 and 7, 2007, followed by confirmation sampling, which confirmed that the tank held diesel/fuel oil No. 2 (PAP-00028520-21, 52).

According to the *Remedial Action Report Addendum 6th Street Area during April 2009-August 2009, Netti Spiegel Trucking*, dated June 2010, the future construction of a sports complex will serve as part of proposed engineering controls (i.e., cap) in conjunction with institutional controls (PAP-00030115). During 2008 and 2009, 949.6 tons of material was excavated and disposed of offsite to remove soil hot spots and/or non-aqueous phase liquid (NAPL) source areas (PAP-00030118-19).

Approximately 500 feet of 2-inch diameter steel piping positioned approximately two feet bgs was discovered on June 2, 2009, during utility installations. The piping contained residual No. 2 and/or No. 4 fuel oil. On July 8, 2009, two 6-inch diameter steel pipes approximately 100 feet long were discovered near the intersection of 6th Street and Cape May Street, located parallel to Cape May Street and positioned approximately four feet bgs. The piping contained residual No. 2 and/or No. 4 fuel oil (PAP-00030120). The pipes were removed and disposed of offsite, along with 60 gallons of product collected from the pipes (PAP-00030121).

The *Remedial Action Report - Soil, Former Netti Spiegel Trucking*, dated April 11, 2012, states that all structures previously present at the Spiegel property were removed and the Red Bull Area was installed (PAP-00030877). This included installation and placement of certified clean fill; installation of impervious site improvements, including building foundations, playing field, concrete sidewalks/pavement, and asphalt driveways; and, installation of a sub-slab vapor mitigation system (PAP-00030884-85).

8. Summary of Asserted Defenses

EnPro asserts that if and to the extent PAHs were present in fuel oil that may have been released to the environment during Crucible operations, Respondent [EnPro Holdings, Inc.] contends that such releases are excluded from CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act] coverage pursuant to the petroleum exclusion, 42 U.S.C. § 9601(33).

Respondent [EnPro Holdings, Inc.] has, and Crucible Steel Corporation had, no relationship to any parties that released or disposed of COCs at the Facility following Crucible Steel Corporation's sales of the western portion (Guyon Property) in 1947 and 1967 and the eastern portion (Spiegel Property) in 1974.

EPEC POLYMERS, INC.

Facility Name, Address and Size: Tenneco Chemicals, Inc., 290 River Drive, Garfield, New Jersey. The facility was 6.9 acres and had up to 250 employees with 3 shifts operating 7 days per week in 1970 and 1972 (PAP-00039956; PAP-00324651).

1. **Business Type:** Manufacturer of bulk intermediate chemicals such as formaldehyde, benzoic acid, salicylic acid, and fumaric acid for the resin, plastic, food, and pharmaceutical industries (PAP-00039956).

2. **Time Period of Ownership/Operations**

   Operator: ~1900 – December 1, 1982
   Owner: ~1900 – December 1, 1982

1965: On March 1, 1965, Heyden Newport Chemical Corporation (Heyden Newport) changed its name to Tenneco Chemicals, Inc. (Tenneco) and Tenneco Corporation was identified as the sole stockholder of the company (PAP-00039737-42). A Revised ECRA [*Environmental Cleanup Responsibility Act] Sampling Plan Investigation Report*, dated September 1991, stated that Heyden had owned and operated the facility since the early 1900s as several forms of the Heyden name (PAP-00040999).

1982: Tenneco Chemicals, Inc. operated at the Garfield facility until December 1, 1982, when the facility and the business that sold products manufactured at the plant were sold to Kalama Chemical Inc. (Kalama) in an Asset Sales Agreement. Assets identified in the sale included the machinery, equipment, furniture, fixtures, raw materials, work in progress, finished goods, operating supplies, etc. (PAP-00039792-95). Kalama Chemical Inc. took over the facility and is the current owner of the site. Kalama is a wholly owned subsidiary of Goodrich Corporation.

On December 3, 1982, Tenneco Polymers, Inc. was incorporated in the State of Delaware (PAP-00039804-07). On December 15, 1982, Tenneco Polymers, Inc. was granted certain assets from Tenneco Chemicals, Inc. Some notable assets included all of the former Heyden's Newport's issued and outstanding shares, and notes, contracts and agreements relating to Tenneco's PVC, methanol, and former acetylene and ammonia businesses, as well as all owned or claimed real property. Several plant sites were listed, but the Garfield facility was not included because it was previously sold to Kalama (PAP-00039831-36).

1983: On February 14, 1983, Tenneco Chemicals, Inc. changed its name to Tenneco Resins, Inc. (PAP-00039811). EPEC noted in its Statement of Position, dated May 24, 2012, that Tenneco Resins, Inc. continued to operate as a subsidiary of Tenneco Polymers, Inc. for three more years (PAP-00039758). On August 26, 1985, Tenneco Resins, Inc. filed for Dissolution (PAP-00039827).

1988: Pursuant to a Corporate Substitution Agreement between Tenneco Resins, Inc. and Kalama Chemicals, Inc. effective August 25, 1988, Tenneco Polymers, Inc. was substituted for Tenneco Resins, Inc. and agreed to assume Tenneco Resins ' responsibilities and liabilities for ECRA cleanup of the Garfield Plant if any as well as the obligations and liabilities to Kalama pursuant to Section 8(b) of the Asset Sales Agreement. This section stated that all liabilities arising out of the condition of the plant premises at or prior to the Closing Date and the operation of the plant prior to the closing date during the period of Seller's ownership, i.e., since October 4, 1963, would remain the liability of Tenneco Resins, Inc. and that Tenneco Resins had provided Kalama with evidence of liability insurance in customary form on an "occurrence" basis, which had been in effect during Tenneco's period of ownership (PAP-00039838-40).

1994: A Settlement Agreement between Tenneco Polymers, Inc. and Kalama dated April 28, 1994, describes the previous disputes between the two companies and t responsibilities with respect to remediation activities at the Garfield property. This Agreement also identified Tenneco Polymers, Inc. with the Tenneco, Inc. family of businesses (PAP-00039844-72).

1996: On December 12, 1996, Tenneco Polymers, Inc. changed its name to EPEC Polymers, Inc. (PAP-00039829). Based on several Remedial Investigation Reports and Remedial Action Progress Reports, EPEC participated in the remediation of the facility in the early 2000s (see PAS-00008864, PAS-00008946, PAS-00009143, PAS-00009261, PAS-00009298, PAS-00009411, PAS-00009458, PAS-00009505, PAS-00009545).

On December 11, 1996, El Paso Merger Company merged with Tenneco Inc. of Delaware into El Paso Tennessee Pipeline Co. (PAP-00039744). A Certificate of Conversion of a Delaware Corporation of El Paso Tennessee Pipeline Co. to El Paso Tennessee Pipeline Co., LLC, dated September 29, 2011, identified Tenneco Holdings, Inc. as the original name of the company (PAP-00039750, 52-53).

3. Operational History/COC Use and Presence at the Facility

A *Sampling Plan for Site Evaluation*, (Sampling Plan) dated August 1987, stated that the facility had been used to manufacture salicylic acid, formaldehyde, and methyl salicylate since 1903. As discussed in this Sampling Plan, the buildings used to manufacture benzoic acid and benzaldehyde were constructed in 1967. This operation was shut down in 1984. Manufacturing of formaldehyde ceased in 1982. Additional chemicals manufactured at the facility included methyl, propyl, ethyl, and butyl esters of para-hydroxybenzoic acid, methylene disalicylic acid, and sodium, potassium, and magnesium salicylate salts (PAP-00040251).

According to a Waste Effluent Survey dated May 19, 1972, the facility manufactured bulk intermediate chemicals such as formaldehyde, benzoic acid, salicylic acid, and fumaric acid for the resin, plastic, food, and pharmaceutical industries (PAP-00039956). The survey stated that water from the Passaic River was used for non-contact cooling water

and for barometric condensers. All manufacturing waste was reported to go to sanitary/chemical sewers (PAP-00039957, 59).

A report prepared for the EPA by Acurex Corporation titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, described the sampling of waste streams discharged to the wastewater treatment facility from five of the facility's products (PAP-00040067-68). Results for metal chemicals of concern (COCs) are reported in the table below, as well as results for two samples of inlet water from the municipal water system and the Passaic River. The processes used to manufacture these five products and their waste streams were described as follows:

- Benzoic Acid/Benzaldehyde: Benzoic acid was manufactured by liquid phase oxidation of toluene in the presence of a cobalt catalyst. The reactor overhead gas was condensed and sent to a scavenger tank, where water was separated and disposed. Reactor effluent was stripped and washed, then sent to the benzaldehyde still. The still bottoms were discharged as waste (PAP-00040071-74).

- Sodium Benzoate: Benzoic acid was reacted with sodium carbonate, condensate, and carbon. The reactor effluent was filtered and scrubbed. The solids were removed from a liquid product stream and disposed (PAP-00040076).

- Salicylic Acid: Phenol and 50 percent sodium hydroxide were mixed and dried in a spray dryer. The dried product was reacted with carbon dioxide in a reactor and then neutralized with sulfuric acid and water. The product was then carbon treated and precipitated by adding more sulfuric acid. The precipitator effluent was cooled using a non-contact flash cooler, and the overhead was condensed and then discharged as waste (PAP-00040078).

- Methyl Salicylate: Salicylic acid, methanol, and sulfuric acid were reacted and then neutralized with soda ash and water. The aqueous phase was recycled, while the non-aqueous organic phase from the neutralizer was washed then sent to a vacuum still to generate the product (PAP-00040081, 84).

- Fumaric Acid: Maleic acid was reacted with a catalyst and steam and then vacuum cooled. The vacuum cooler overhead went to a contact condenser, where fumaric acid was recovered via centrifuge (PAP-00040085).

Maximum Concentrations of Metals in Each Product Effluent					
Product	**Composite Sample Sources (flow in gallons per day [gpd])**	**Sample Location / Site**	**Copper (µg/L)**	**Lead (µg/L)**	**Mercury (µg/L)**
Benzoic Acid/ Benzaldehyde	Scavenger tank effluent, scrubber liquor, wash tank, still bottom residue (2,320 gpd)	OPQRS	18	<10	<1
Sodium Benzoate	Reactor scrubber effluent (72,000 gpd)	L	11	<10	<1
Salicylic Acid	Spray dryer scrubber, vacuum jet for Reactor No.3, flash cooler, “10E-1 sal acid nutsche” (194,720 gpd)	CDEG	450	<25	1.5
Methyl Salicylate	Spent acid tank and wash column overflow (7,140 gpd)	IJ	3,200	450	1
Fumaric Acid	Centrifuge effluent and contact condenser (91,300 gpd)	AB	39	<10	1*
Passaic River	River water	U	104	15	<1
Passaic Valley	Municipal water	T	14	<10	1.3
References	PAP-00040093, 96	PAP-00040093	PAP-00040130	PAP-00040131	PAP-00040132

µg/L: micrograms/liter

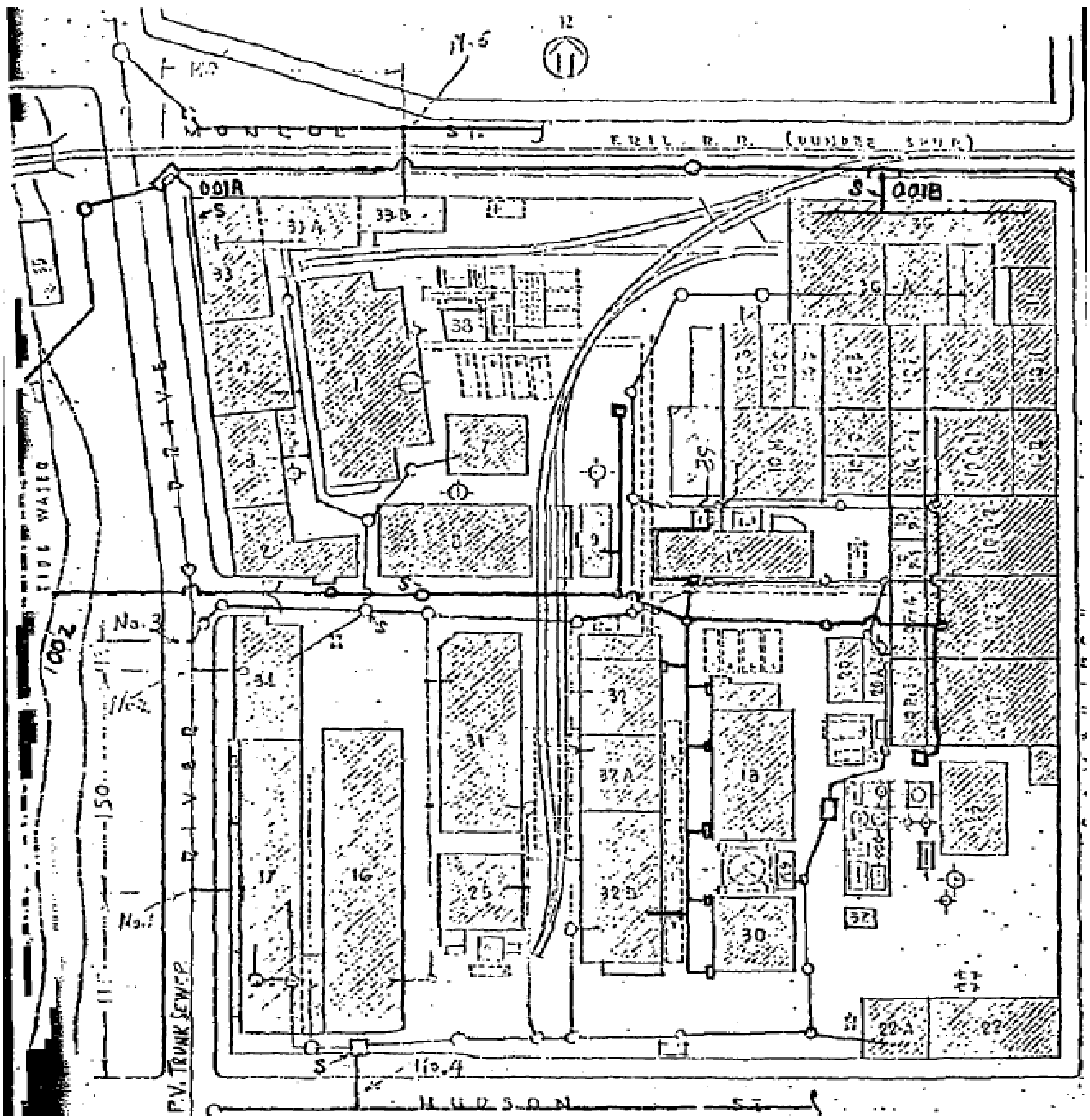
*Note: the mercury result was listed as 1 µg/L for Day 3 of sampling in the raw analytical data table, but the adjusted concentration table listed the mercury result for Day 3 as not detected (PAP-0040142). It is not clear how the data were adjusted.

A New Jersey Department of Environmental Protection (NJDEP) Pretreatment/Residual Waste Survey, dated July 27, 1981, stated that copper and mercury were present in the discharge of over 25,000 gallons per day to the publicly owned treatment works (POTW) (PAP-00040183, 188). An application for permit to discharge to a domestic treatment works, dated February 26, 1982, listed the City of Garfield sewer and the Passaic Valley Sewerage Commission (PVSC) treatment plant as the recipients of the effluent, which contained 19.53 milligrams/liter (mg/L) copper and 0.001 mg/L mercury. Polycyclic aromatic hydrocarbons (PAHs), PCBs, lead and pesticides were not detected in the effluent (PAP-00040202, 210-211).

Five outlets to the sanitary sewer (Outlets Nos. 1 through 5) were identified in an undated PVSC application for a sewer connection permit and a letter to the PVSC from Tenneco dated December 16, 1980. Outlet Nos. 3 and 4 were stated to contain industrial waste. Outlet No. 5 was stated to be eliminated as wastewater was diverted to

Outlet No. 3. It was also noted that Outlet No. 4 was in the process of being eliminated with most wastewater already diverted to No. 3 (PAP-00040044; PAP-00040165-66).

The PVSC permit application provided the following site map with Outlets Nos. 1 through 3 along River Drive, Outlet No. 4 to the south at Hudson Street, and Outlet No. 5 to the north at Monroe Street:



(PAP-00040045)

Outfalls to the Passaic River

Three outfalls to the Passaic River were identified in the facility's National Pollutant Discharge Elimination System (NPDES) permit to discharge No. NJ 0000124, effective June 30, 1974 (PAP-00039966). Outfalls with the following discharge serial numbers

were identified: 001A and 001B; 002; 005. Effluent limitations on these outfalls did not identify COCs. Outfall 005 was limited to containing chemicals or other substances less than or equal to what was found in the receiving waters (PAP-00039969).

An application to renew the NPDES permit No. NJ 0000124, dated November 28, 1978, stated discharges through outfall 001 began in 1940 and outfall 002 had been used since 1953 (PAP-00324735, 43).

A NJDEP Application for Approval of Plans, dated April 1, 1975, outlined Tenneco's plans to monitor its cooling water return to the Passaic River and reduce sources of pollution entering the Passaic River (PAP-00039995). The application identified the outfalls as follows (see above figure for locations along Monroe Street and at the middle of the facility):

- 001A: Cooling water effluent from Building 33 was connected to the Monroe Street drainpipe and discharged from the drainpipe into the Passaic River (PAP-00039997).

- 001B: Cooling water effluent from Building 36 was connected to a catch basin in the Monroe Street drainpipe (PAP-00039998).

- 002: The major effluent stream containing all of the river water returns from the plant, except Buildings 33 and 36 (PAP-00039998).

The plans stated that droplets of process water were entering the cooling water returned to the Passaic River and proposed a filter to remove the pollutants as well as discharging contaminated cooling water to the sanitary sewer (PAP-00039997-40000). An April 1, 1975 letter to the PVSC submitted with the application stated the contaminated cooling water would increase the volume of water discharged to the PVSC by "75M" gallons per day (PAP-00040008).

A letter to the NJDEP from Tenneco, dated April 18, 1975, identified outfall 005 as river water screens used at the pump house to keep leaves and debris out of the pumps. The screens were kept clean with a continuous backwash to the river (PAP-00040018).

4. Identified COCs

- PCBs (used, detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

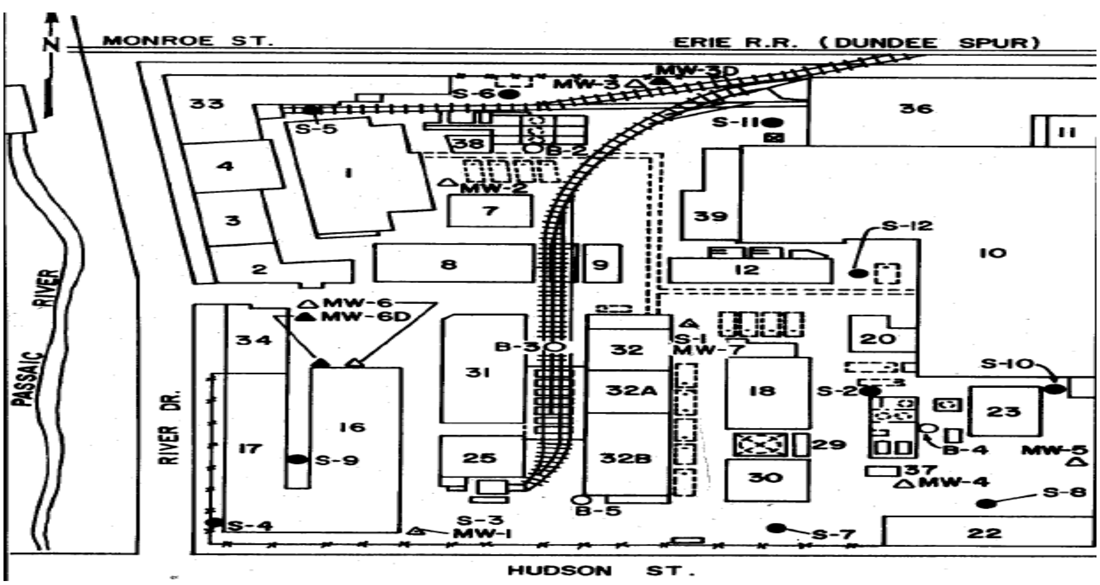
PCBs

A NJDEP Pretreatment/Residual Waste Survey, dated July 27, 1981, stated equipment such as transformers, high voltage capacitors, or heat transfer systems containing PCB fluids were present at the facility (PAP-00040185). According to a Revised Sampling Plan Addendum, dated March 1990, the transformers at Buildings 1 and 12 were

inspected in 1981 and found not to contain PCBs. Site personnel stated that these transformers had not contained PCBs for at least 10 years and it is possible that they may never have contained PCBs. Soil samples were proposed to verify the absence of contamination in soils in these areas due to leakage from the transformers (PAP-00040585).

Two areas containing transformers were identified as areas of environmental concern (AECs) in the *Revised Remedial Action Work Plan*, dated March 31, 1995 (1995 RAWP) (PAP-00041652). PCBs were not detected in site soil at AEC-23 (Transformers at Building 1), but were detected in soil samples collected from AEC-24 (Transformer at Building 12) at a maximum of 2.2 milligrams/kilogram (mg/kg) for Aroclor-1260 (PAP-00041881-2).

The *Remedial Investigation and Remedial Actions Report, Building 17 Former Sewer Lines*, dated February 26, 2003, (2003 RI/RAR) identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Fill was discovered within the foundation walls of the building and was analyzed for PCBs as part of the waste disposal characterization. PCBs were detected at 15.8 parts per million (ppm) in one soil sample, but additional delineation samples did not detect PCBs. An area of 19 feet by 27 feet was excavated to a depth of 4 feet around the sample location (PAP-00044391-92). Building 17 was located in the southwestern corner of the site. Note that the fill with PCBs was within the foundation walls of Building 17.



(PAP-00040419)

PAHs

According to a *Preliminary Investigation of Soil Quality Conditions at the Kalama Chemical, Inc. Facility in Garfield, New Jersey*, dated December 1986, PAHs were detected in soil samples collected from the following areas: underground storage tanks (USTs) containing fuel oil, the benzaldehyde production area, and a chemical transfer area (PAP-00040240, 43).

Further investigation noted that PAHs were detected in soil samples collected all over the site. According to the data reported in the 1995 RAWP, PAHs were detected at most AECs when soil samples were analyzed for these parameters (PAP-00041858-86). Concentrations were generally less than or equal to 1 mg/kg, which is less than average concentrations associated with historic fill (see discussion of historic fill below). The highest concentrations were detected at AEC-11 (Former No. 2 Fuel Oil USTs), AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39), and AEC-21 (Drum Storage Area Buildings 16 and 17). The maximum concentrations of PAHs were detected from soil sample AEC-15-1C at AEC-15 (see concentrations in the discussion of Historic Fill and in Section 7, Response Actions) (PAP-00042265).

The *Revised Remedial Action Work Plan Addendum*, dated February 29, 1996 (RAWP Addendum) stated that fill material, including sand, gravel, brick and rock fragments, cinders, and ash, had been noted at the site and extending off site. The RAWP Addendum investigated soil boring B-52-A, detecting concentrations of benzo(a)pyrene up to 42 ppm, and attributed the elevated PAH concentrations to the presence of fill (PAP-00042178-79).

The 2003 RI/RAR found elevated PAHs detected in mud from a concrete basin (AEC-32A) north of Building 17 (i.e., 6.1 ppm of benzo(a)anthracene; 4.45 ppm of benzo(b)fluoranthene; 3.04 ppm of benzo(k)fluoranthene; and 4.42 ppm of benzo(a)pyrene). It was stated that this basin drained sinks in the laboratory, but did not connect to a sewer and instead had vents to allow for evaporation (PAP-00044389, 91).

Copper

Although descriptions of the manufacturing processes did not specifically identify copper as being used at the facility, an application for permit to discharge to a domestic treatment works, dated February 26, 1982, stated copper was a component of a substance used and/or manufactured at the facility over the next five years (PAP-00040212).

A NJDEP Pretreatment/Residual Waste Survey, dated July 27, 1981, stated copper was present in the discharge to the POTW (PAP-00040183, 188). Furthermore, copper was detected in effluent samples collected in 1979, 1980, and 1982 as follows:

- An undated PVSC sewer connection application included results for composite samples collected from industrial waste outlet Nos. 3 and 4 in June 1979. Copper was detected at a maximum of 0.070 mg/L (PAP-00040046-47; PAP-00040048).

- According to a report for the EPA titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, copper was detected in all five waste streams from the facility's products (see Section 3, Operational History/COC Use and Presence at the Facility above). However, the report identified copper as detected above trace levels in only three of the product waste streams: salicylic acid (copper at 450 µg/L), methyl salicylate (copper at 3,200 µg/L), and fumaric acid (copper at 39 µg/L)

(PAP-00040067-68, 130). Copper was also detected in the municipal water (14 µg/L; see table in Section 3 above) (PAP-00040130).

- A *Heavy Metals Source Determination Study* by the PVSC, dated April 1980, identified Tenneco as discharging 0.189 mg/L (0.922 pounds per day) of copper (PAP-00322628).

- According to an application for permit to discharge to a domestic treatment works, dated February 26, 1982, copper was detected in the effluent discharged to the PVSC at 19.53 mg/L (PAP-00040210, 12).

Copper was detected in surface soil (Sample B-47-Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at a maximum concentration of 550 mg/kg (PAP-00041872). Copper was also detected in filter cake material at 223 mg/kg located between crushed white rock found in a 40-foot-long concrete trough at Building 17 (AEC-32C, Concrete Trough). The soil sample collected beneath the trough detected copper at 52.4 ppm. An area of 12.5 feet by 60 feet and 5 feet deep was excavated around the concrete trough in 2002, and included 216 tons of soil (PAP-00044395-97, 455).

Lead

According to a report for the EPA titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, lead was detected in the waste stream from the manufacture of methyl salicylate at 450 µg/L (PAP-00040067-68, 131). A *Heavy Metals Source Determination Study* by the PVSC, dated April 1980, identified Tenneco as discharging 0.394 mg/L (1.922 pounds per day) of lead (PAP-00322628).

Lead was detected in surface soil (Sample B-47-Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at an elevated concentration of 820 mg/kg. The 1996 RAWP Addendum attributed this concentration to fill material present at the site (PAP-00042177, 80).

According to the 2003 RI/RAR, lead was detected in filter cake material at 594 ppm found at AEC-32C (Concrete Trough) in Building 17. Soil beneath the trough contained lead at 43.6 ppm (PAP-00044395-97, 455). After the trough was excavated in 2002, the loading dock between Building 16 and Building 17 was investigated. Fill material consisting of crushed rock, brick, wood chips, and glass was found beneath the loading dock. The fill was 1 foot thick, while the native soil beneath consisted of a fine sandy silt. A sample from the fill material contained 42,000 ppm lead, while the native soil beneath this location detected lead at 35.9 ppm. Approximately 166 tons of soil were excavated from this area in 2002 (PAP-00044397-99, 457).

Mercury

Although mercury was not identified as used in the facility processes, purchase orders from 1973 identified the purchased caustic soda as mercury cell material. Analytical results from the caustic soda manufactured using the mercury cell process were not available to verify that the caustic soda did not contain any trace impurities of mercury (PAP-00324677; PAP-00324679; PAP-00324684).

A NJDEP Pretreatment/Residual Waste Survey, dated July 27, 1981, stated mercury was present in the discharge to the POTW (PAP-00040183, 188). Furthermore, mercury was detected in effluent samples collected in 1979, 1980, and 1982 as follows:

- An undated PVSC sewer connection application included results for composite samples collected from industrial waste outlets No. 3 and 4 in June of 1979. Mercury was detected at a maximum of 0.00123 mg/L (PAP-00040046-47; PAP-00040048).

- According to a report for the EPA titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, mercury was detected in the waste stream from the manufacture of salicylic acid (0.0015 mg/L), methyl salicylate (0.001 mg/L), and fumaric acid (0.001 mg/L), as well as the municipal water (PAP-00040067-68, 132).

- A *Heavy Metals Source Determination Study* by the PVSC, dated April 1980, identified Tenneco as discharging 0.001 mg/L (0.0044 pounds per day) of mercury (PAP-00322628).

- An application for permit to discharge to a domestic treatment works, dated February 26, 1982, stated mercury was detected at 0.001 mg/L in the effluent discharged to the PVSC (PAP-00040210).

Mercury was detected in subsurface soil (depth of 4 to 4.5 feet, Sample B-53 Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at a maximum concentration of 18.6 mg/kg (PAP-00041873). Mercury was also detected in filter cake material at 100 mg/kg located between crushed white rock found in a 40-foot-long concrete trough at Building 17 (AEC-32C, Concrete Trough). The soil sample collected beneath the trough detected mercury at 0.58 ppm. An area of 12.5 feet by 60 feet and 5 feet deep was excavated around the concrete trough in 2002, and included 216 tons of soil (PAP-00044395-97, 455).

According to the 2003 RI/RAR, mercury was detected in soil at a maximum concentration of 15.5 ppm from beneath the sewer line that ran from Building 17 south to the Hudson Street sewer line. The soil along the sewer line consisted of crushed stone/slag fill material underlain by sand, silt, and silty sands. Approximately 110 tons of soil were excavated from this sewer line (AEC-33) (PAP-00044400-1).

Historic Fill

The Allocation Team has determined that the majority of the facility site is not located on regional historic fill as designated by the NJDEP.[1] However, there may be historic fill present at the northwest corner of the site under Monroe Street. In addition, the 1996 RAWP Addendum attributed elevated concentrations of PAHs and lead at the former Salicylic Acid/Salicylate Production Buildings located at the northeast portion of the site to the presence of fill (PAP-00042177-80).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing historic fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of historic fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00041873; PAP-00042265).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	42,000 mg/kg
Copper	550 mg/kg
Mercury	18.6 mg/kg
Benzo(a)anthracene	41.0 mg/kg
Benzo(a)pyrene	42.0 mg/kg
Benzo(b)fluoranthene	38.0 mg/kg
Benzo(k)fluoranthene	13.0 mg/kg
Dibenzo(a,h)anthracene	5.5 mg/kg
Indeno(1,2,3-cd)pyrene	33.0 mg/kg
PCBs	15.8 mg/kg

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #42 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of historic fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area historic fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

5. COC Pathways

Sanitary and Storm Sewer

A letter from Tenneco to the PVSC, dated January 14, 1970, stated there was an unknown break in the sanitary sewer line near the south outfall from the facility. The facility stated they plugged the outfall and all discharge was diverted to the chemical sewer (PAP-00324649).

A PVSC questionnaire dated February 28, 1970, stated the facility discharged sanitary and industrial waste to the PVSC trunk line at an average rate of 355,000 gallons per day (PAP-00324652).

According to an application submitted to the Department of the Army Corps of Engineers for a permit to discharge or work in navigable waters and their tributaries, dated June 25, 1971, the facility used 0.5 million gallons of process water per day. The facility discharged 0.75 million gallons per day to the municipal waste treatment system (PAP-00039877; PAP-00039897, 901).

Tenneco submitted a Waste Effluent Survey, dated May 19, 1972, to the PVSC. This survey listed 750,000 gallons of water discharged to the sanitary sewer per day. The effluent was stated to contain less than 1 ppm (or 6.2 pounds per day) each of lead, copper, and mercury. The discharges were stated to continue 24 hours per day (PAP-00039957-58).

An undated PVSC sewer connection application stated that 488 million gallons were discharged to the sanitary sewer in 1978. Five outlets to the sewer were identified; three outlets were stated to contain industrial waste. Composite samples collected from industrial waste outlet Nos. 3 and 4 in June of 1979 contained maximums of 0.070 mg/L copper, less than 0.125 mg/L lead, and 0.00123 mg/L mercury (PAP-00040042, 44, 47; PAP-00040048).

Five outlets to the sanitary sewer were identified in an undated PVSC application for sewer connection permit (PAP-00040044) and a letter to the PVSC from Tenneco dated December 16, 1980 (PAP-00040165). The flow in 1980 was identified as:

- Outlet No. 1: 5,000 gallons per day to the sanitary sewer
- Outlet No. 2: 5,000 gallons per day to the sanitary sewer (PAP-00040044)
- Outlet No. 3: 540,000 gallons per day containing industrial waste
- Outlet No. 4: 1,000 gallons per day containing steam condensate
- Outlet No. 5: no flow as this outlet was eliminated (PAP-00040166)

Outlet No. 5 was stated to be eliminated with wastewater diverted to outlet No. 3. It was also stated that most of the wastewater from Outlet No. 4 was diverted to No. 3 (PAP-00040165). The undated PVSC permit application stated the flow through Outlet Nos. 4 and 5 were 150,000 and 4,000 gallons per day, respectively. The flow for Outlet No. 3 was 1,100,000 gallons per day, but was noted to be incorrect (PAP-00040044).

The report titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, stated 1.034 million gallons per day were discharged to the municipal sewage treatment plant (PAP-00040089). However, a Heavy Metals Source Determination Study by the PVSC, dated April 1980, identified a flow rate of 0.585 million gallons per day for Tenneco (PAP-00322628).

The individual flow rates for each process discharged through Outlet No. 3 to the City of Garfield sewer and the PVSC treatment plant were identified in an application for permit to discharge to a domestic treatment works, dated February 26, 1982:

- Formaldehyde: 100,800 gallons per day
- Benzoic acid/benzaldehyde: 36,000 gallons per day
- Sodium benzoate: 66,200 gallons per day
- Salicylic acid: 154,100 gallons per day
- Fumaric acid: 46,100 gallons per day
- Methyl Salicylate: 36,000 gallons per day (PAP-00040202).

A letter to the PVSC submitted with the Application for Approval of Plans, dated April 1, 1975, stated that diverting the contaminated cooling water to the sanitary sewer would increase the volume of water discharged to the PVSC by “75M” gallons per day (PAP-00040008).

Direct Release

A *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor*, dated November 1969, identified four outfalls from Tenneco with large flows at Passaic River mile 16.2. The remarks stated that the discharge may contain detergent and dead fish were noted in the outfalls (PAS-00114006).

A letter from Tenneco to the PVSC, dated January 14, 1970, stated Tenneco was investigating possible sources of pollution to the Passaic River from their plant. Tenneco found old drains which may have received overflows from the pilot plant. In addition, Buildings 32 and 36 were connected to conduits that fed to the river. Tenneco stated they would tie the floor drains from the pilot plant and the process area floor drains to the chemical sewer (PAP-00324647-8).

A PVSC questionnaire dated February 28, 1970, stated the facility discharged cooling water waste (thermal pollution only) to the Passaic River at an average rate of 2.8 million gallons per day (PAP-00324652).

According to an application submitted to the Department of the Army Corps of Engineers for a permit to discharge or work in navigable waters and their tributaries, dated June 23, 1971, the facility used 5.8 million gallons per day of cooling water sourced from the river. The river water return outfall was stated to be sampled and analyzed periodically, but the results were not available (PAP-00039877; PAP-00039897, 901).

Tenneco submitted a Waste Effluent Survey, dated May 19, 1972, to the PVSC. This survey listed 5.48 million gallons of water discharged to the Passaic River per day. The effluent was stated to contain less than 0.1 mg/L (or 5 pounds per day) each of lead, copper, and mercury. The river water was stated to be used for non-contact cooling water and barometric condensers (PAP-00039957, 59).

According to the PVSC Annual Report for 1973, Tenneco had a 2-inch boiler blow down line to the Passaic River, and it was confirmed that the discharge was polluting in November 1973 based on a collected sample. Information for this sample was not provided (PAS-00008608). According to the PVSC Annual Report for 1974, the equipment was installed to divert this discharge to the sanitary sewer, and this violation was eliminated on June 6, 1974 (PAS-00008610).

An Engineer's Preliminary Report, dated October 28, 1974, stated Outfalls 001 and 002 contained cooling water return and stormwater runoff from Monroe Street and the facility. It was stated that the discharge through 001 contained contact cooling water from Building 36. This report also identified potential sources of contamination in Outfall 002, including contact cooling water discharged from Building 12, effluent from a scrubber in Building 10-T, and floor drains in Building 32. The report recommended eliminating the contact cooling water from the outfalls and directing the potential sources of pollution to the sanitary sewer (PAP-00324693-95).

According to a Tenneco Status Report dated April 18, 1975, from August 1974 to March 1975, the daily volume of discharge from Outfall 001 ranged from 4.3 million to 15.3 million gallons per day. For the same time period, the daily volume discharged through Outfall 002 was 24 million to 32.5 million gallons per day (PAP-00040019).

A NPDES Plant Inspection performed on September 29, 1977 stated approximately 1.0 million gallons per day were discharged from Outfall 001, 3.2 million gallons per day were discharged through Outfall 002, and approximately 1 million gallons per day were discharged through Outfall 005 (PAP-00040027).

An undated PVSC sewer connection application stated that 1,100 million gallons per year were discharged to a storm sewer, river, or ditch in 1978 (PAP-00040042).

The report titled *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, stated 3.309 million gallons per day of untreated wastewater was discharged through two outfalls to the Passaic River (PAP-00040089).

A NJDEP Application for Approval of Plans, dated April 1, 1975, outlined Tenneco's plans to monitor its cooling water return to the Passaic River and reduce sources of pollution entering the Passaic River (PAP-00039995). The plans stated that process water was entering the cooling water returned to the Passaic River and proposed a filter to remove the pollutants as well as discharging contaminated cooling water to the sanitary sewer (PAP-00039997-40000). An April 1, 1975 letter to the PVSC submitted with the application stated the contaminated cooling water would increase the volume of water discharged to the PVSC by "75M" gallons per day (PAP-00040008).

6. Regulatory History/Enforcement Actions

Inspections

A NPDES Plant Inspection was performed September 29, 1977. The inspection report identified the three outlets and found several exceedances of the temperature limits (PAP-00040026).

Violations

A violation and elimination was identified in the PVSC Annual Report for 1972. According to this report, a leak developed in the sewer line under River Road and was sealed as soon as it was detected. An inspector noted that the by-passed waste was being pumped into a storm sewer that led to the Passaic River on December 28, 1972. The flow was then diverted to the sanitary sewer to halt the pollution. The sewer line was repaired on December 29, 1972 (PAS-00008606).

A violation was identified in the PVSC Annual Report for 1973. The report stated Tenneco had a 2-inch boiler blow down line to the Passaic River, and it was confirmed that the discharge was polluting in November 1973 based on a collected sample. Information for this sample was not provided. According to the Annual Report, Tenneco was purchasing equipment to divert this discharge to the sanitary sewer (PAS-00008608). According to the PVSC Annual Report for 1974, the equipment was installed and this violation was eliminated on June 6, 1974 (PAS-00008610).

The PVSC Annual Report for 1976 identified a violation and elimination due to a complaint of suds entering the Passaic River from Tenneco on September 1, 1971. Tenneco had been cleaning their 2,000-gallon Reactor No. 1 on the fourth floor and the soap drained into the sanitary sewer at too high a flow rate. The soapy water overflowed into the yard, draining into the storm sewer and then the Passaic River. The overflow was stopped and Tenneco stated they would use an alternate hose to drain the soapy water. A sample collected from the storm sewer was stated to be acceptable, but information for this sample was not provided (PAS-00008612-13).

Permits

NPDES permit No. NJ 0000124 to discharge to the Passaic River was effective for the facility on June 30, 1974, and expired June 30, 1979 (PAP-00039966). The following discharge serial numbers were identified: 001A and 001B; 002; 005. Limitations on these outfalls did not contain COCs. Outfall 005 was limited to containing chemicals or other substances less than or equal to what was found in the receiving waters (PAP-00039969).

On September 21, 1978, the NPDES permit was modified effective October 21, 1978, for the limitations of non-COCs (PAP-00324725-29). Tenneco applied to renew their NPDES permit on November 28, 1978 (PAP-00324732).

NJPDES SIU Permit No. NJ0000124 for the discharge of industrial wastewater to the PVSC facility was effective December 1, 1982, and expired November 30, 1987. The permit stated the facility was subject to effluent limits and monitoring requirements, but these criteria were not available (PAP-00040237).

7. Response Actions

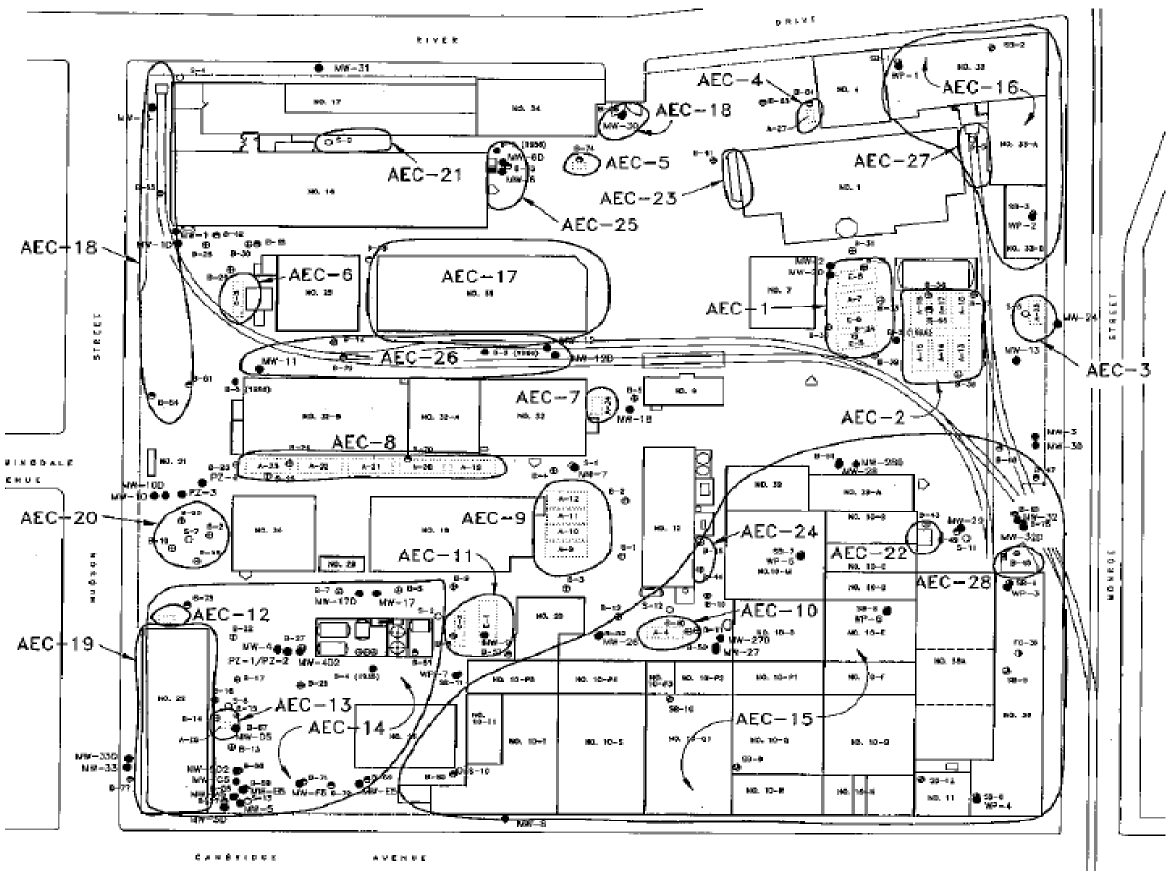
Characterization Activities

The following characterization activities have taken place at the facility:

- *Verification Sampling and Analysis for Priority Pollutants at Tenneco Chemicals (Garfield, New Jersey)*, dated October 1980, by Acurex Corporation (PAP-00040062).
- *Preliminary Investigation of Soil Quality Conditions at the Kalama Chemical, Inc. Facility in Garfield, New Jersey*, dated December 1986, by Geraghty & Miller, Inc. (PAP-00040239).
- *A Sampling Plan for Site Evaluation*, dated August 1987, by Geraghty & Miller, Inc. (PAP-00040248).
- *ECRA Soil and Groundwater Investigation at the Kalama Chemical, Inc. Facility, Garfield, New Jersey*, dated June 1988, by Geraghty & Miller, Inc. (PAP-00040387).
- *Revised Sampling Plan Addendum*, dated March 1990, by Geraghty & Miller, Inc. (PAP-00040575).
- *Revised ECRA Sampling Plan Investigation Report, Kalama Chemical, Inc. Facility*, dated September 1991, by Geraghty & Miller, Inc. (PAP-00040980).
- *Draft ECRA Investigation Report and Proposed Remedial Action Workplan*, dated December 1993, by Geraghty & Miller, Inc. (PAP-00041189).
- *Revised Remedial Action Work Plan*, dated March 31, 1995, by SECOR International Inc. (PAP-00041624).
- *Revised Remedial Action Work Plan Addendum*, dated February 29, 1996, by SECOR International Inc. (PAP-00042155).
- *Remedial Investigation and Remedial Actions Report*, dated September 17, 2001, by Sovereign Consulting Inc. (PAP-00043851).
- *Remedial Investigation and Remedial Actions Report, Building 17 Former Sewer Lines*, dated February 26, 2003, by Sovereign Consulting Inc. (PAP-00044382).
- *Comprehensive Remedial Action Work Plan Addendum*, dated March 14, 2008, by Sovereign Consulting Inc. (PAP-00323651).

Soil

Soil sampling was performed from 1986 through 1993 and summarized in the 1995 RAWP. The 1995 RAWP identified 28 AECs that generally included former locations of USTs (e.g., AECs 1, 3, 6, 10, 11 contained fuel oil USTs), drum and scrap metal storage areas (AECs 19, 20, 21), production areas (AECs 14, 15, 16, 17), transformers (AECs 23, 24), and loading/unloading areas (AECs 24 through 28) (PAP-00041648-52).



(PAP-00041795; note north is to the right in this figure)

Metal COCs were detected at AEC-14, AEC-15, and AEC-18 as listed in the table below. Highest levels of metals contamination in soil were noted at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39). The 1996 RAWP Addendum attributed the lead concentration at AEC-15 to the presence of fill at the site (PAP-00042180).

Metal COCs Detected in Soil				
AEC	**Description**	**Copper**	**Lead**	**Mercury**
AEC-14	Benzoic Acid/ Benzaldehyde Production Area	7.8 mg/kg	(3.4 U)	(0.11 U)
AEC-15	Salicylic Acid/ Salicylate Production Buildings 10/36/39	550 mg/kg	820 mg/kg	18.6 mg/kg
AEC-18	Sewer Lines	190 mg/kg	446 mg/kg	0.68 mg/kg

U: Not detected (PAP-00041871-73, 76)

PCBs were detected in site soil at AEC-24 (Transformer at Building 12) at a maximum of 2.2 mg/kg for Aroclor-1260 (PAP-00041882). In addition, according to the 2003 RI/RAR, PCBs were detected at 15.8 pm in one sample collected from the fill “within the foundation walls” of Building 17, but additional delineation samples did not detect PCBs (PAP-00044391-92).

PAHs were detected at most AECs, but concentrations were generally low (less than average concentrations associated with historic fill as discussed in Section 4, Identified COCs), with the highest concentrations detected at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39). The 1996 RAWP Addendum attributed these concentrations to the presence of fill at the site (PAP-00042179). The maximum concentrations of PAHs were detected as follows:

Maximum PAHs Detected in Soil Samples			
PAHs (ppm)	**S-2 at AEC-14**	**B-52-A at AEC-15**	**AEC-15-1C**
Anthracene	0.85	1.3	13.0
Benzo(a)anthracene	3.0	12.0	41.0
Benzo(a)pyrene	2.4	10.0	42.0
Benzo(b)fluoranthene	5.69	13.0	38.0
Benzo(ghi)perylene	0.96	3.0	43.0
Benzo(k)fluoranthene	NR	2.5	13.0
Chyrsene	4.0	12.0	45.0
Dibenzo(a,h)anthracene	NR	1.0	5.5
Fluoranthene	4.1	14.0	41.0
Fluorene	0.66 U	NR	1.8
Indeno(1,2,3-cd)pyrene	0.95	2.9	33.0
Naphthalene	2.8	0.12 J	0.27 J
Phenanthrene	3.4	4.6	39.0
Pyrene	6.91	20	260

NR: not reported J: estimated concentration U: not detected
(PAP-00041870, 72; PAP-00042265)

The *Remedial Investigation and Remedial Actions Report*, dated September 17, 2001, identified three additional AECs, where PAHs and metals were detected in site soil at concentrations less than the maximums reported above (PAP-00043883-9). The *Remedial Investigation and Remedial Actions Report, Building 17 Former Sewer Lines*, dated February 26, 2003, identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Elevated PAHs were detected in a concrete basin (AEC-32A) north of Building 17 (i.e., 6.1 ppm of benzo(a)anthracene; 4.45 ppm of benzo(b)fluoranthene; 3.04 ppm of benzo(k)fluoranthene; and 4.42 ppm of benzo(a)pyrene). It was stated that this basin drained sinks in the laboratory, but did not connect to a sewer and instead had vents to allow for evaporation (PAP-00044389, 91).

Sewer

In the 1995 RAWP, AEC-18 was identified as the western portion of the sewer line that ran along Hudson Street to south, as well as the sewer outfall 002 near the main gate (PAP-00041651). Metals and PAHs were detected in soil samples collected along the sewer lines at maximum concentrations of 190 ppm copper (Sample B-55-Fill), 446 ppm lead (Sample B-54-Fill), and 0.68 ppm mercury (Sample B-54-Fill) (PAP-00041876).

The sewer lines from Building 17 (AEC-33), Building 32 (AEC-34), and Hudson Street (AEC-35) were removed in 2002. Maximum concentrations of metals in soil beneath the Building 17 line were 92.9 ppm copper, 132 ppm lead, and 15.5 ppm mercury. The soil along the Building 17 sewer line consisted of crushed stone/slag fill material underlain by sand, silt, and silty sands. Soil samples collected at the Building 32 and Hudson Street sewer lines were not analyzed for metals. Approximately 110 tons, 756 tons, and 1,312 tons of soil were removed with each sewer line, respectively (PAP-00044401, 03-04, 13, 59).

Remedial Activities

The *ECRA Soil and Groundwater Investigation at the Kalama Chemical, Inc. Facility, Garfield, New Jersey*, dated June 1988, stated 11 of the 27 USTs were removed from the site in 1987. Five of these USTs contained No. 2 Fuel Oil and ranged from 5,000 to 16,500 gallons in volume (PAP-00040392, 406). According to the Revised Sampling Plan Addendum, dated March 1990, the remaining USTs containing methanol, hexane, MIBK (methyl isobutyl ketone), and No. 6 Fuel Oil were removed between 1987 and 1990 (PAP-00040593-94).

An Administrative Consent Order, dated December 8, 1988, was issued by NJDEP to Kalama Chemical, Inc. the owner of the site at the time (PAS-00008625-33). The remediation agreement was modified September 13, 1996, and Tenneco became the lead responsible party (PAS-00008621-24).

The 2003 RI/RAR identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Fill was discovered "within the foundation walls" of the building and was analyzed for PCBs as part of the waste disposal characterization. PCBs were detected at 15.8 ppm in one soil sample, but additional delineation samples did not detect PCBs. An area of 19 feet by 27 feet was excavated to depth of 4 feet around the sample location (PAP-00044391-92).

This investigation also excavated a concrete trough with elevated metals concentrations located at Building 17, including an area of 12.5 feet by 60 feet and 5 feet deep and consisting of 216 tons of soil (PAP-00044395-97). After the trough was excavated in 2002, the loading dock between Building 16 and Building 17 was investigated. Fill material consisting of crushed rock, brick, wood chips, and glass was found beneath the loading dock. The fill was 1 foot thick, while the native soil beneath consisted of a fine sandy silt. A sample from the fill material contained 42,000 ppm lead, while the native soil beneath this location detected lead at 35.9 ppm. Approximately 166 tons of soil were removed from this area in 2002 (PAP-00044397-99, 457).

The sewer lines from Building 17 (AEC-33), Building 32 (AEC-34) and Hudson Street (AEC-35) were removed in 2002. Maximum concentrations of metals in soil beneath the Building 17 sewer line were 92.9 ppm copper, 132 ppm lead, and 15.5 ppm mercury. Approximately 110 tons, 756 tons, and 1,312 tons of soil were removed with each sewer line, respectively (PAP-00044401, 04, 13).

According to a *Comprehensive Remedial Action Work Plan Addendum*, dated March 14, 2008, no further action (NFA) was approved by NJDEP for the following AECs in a letter dated September 6, 1995: AEC-1 through 8, 10, 16, 22 through 25, 27, and 28. This Work Plan also stated AEC-31 received NFA approval on June 18, 2002, and AEC-32A, 32B, 32C, 32D, 33, 34, and 35 were approved for NFA by NJDEP on October 21, 2003 (PAP-00323694-702, 708, 729, 737-739, 741-742, 749-766).

A letter from NJDEP dated December 30, 2008 approved NFA for the following AECs: 9, 12, 13, 15, 17, 18, 19, 20, 21, 26, and 32A. The letter stated a site-wide cap engineering control was required due to the presence of contaminated historic fill at the site (PAP-00324631).

8. Summary of Asserted Defenses

EPEC asserts that EPEC Polymers, Inc. ("EPI") and El Paso Tennessee Pipeline Co. ("EPTP") received GNL letters from EPA; however, EPI and EPTP never owned or operated the Facility, nor were either company ever successors to any party or parties that owned or operated the Facility. Further, neither party assumed any liability for the alleged discharges at the Facility that are at issue in this allocation. EPI and EPTP respond on behalf of Tenneco Chemicals, Inc. ("TCI"), which was a former owner and operator of the Facility during the Relevant Time Period [October 4, 1963 to December 1, 1983]."

The "Heyden Newport" entity that changed its name to Tenneco Chemicals, Inc. in 1965 was not the same entity that owned the Garfield Facility prior to Tenneco's acquisition. The following statement was provided: "In 1919, Heyden Chemical Company of America, Inc., a New York corporation, reportedly acquired the Garfield Site. In 1925, Heyden Chemical Company of America was consolidated with Denhey Corporation to form Heyden Chemical Corporation, a New York corporation. In March 1943, Heyden Chemical Corporation merged into its parent company, Denhey Holding Corporation, a Delaware corporation, and Denhey Holding Corporation was renamed Heyden Chemical Corporation, also incorporated in Delaware. In March 1943, the Garfield Site was transferred by deed from Heyden Chemical Corporation, a New York corporation, to Heyden Chemical Corporation, a Delaware corporation. Heyden Chemical Corporation then changed its name to Heyden Newport Chemical Corporation ("Old Heyden"). In 1963, Tennessee Gas Transmission Company ("TGT"), Old Heyden, and HDN Corporation, a subsidiary of TGT, entered into a transaction whereby Old Heyden sold its assets to HDN in exchange for shares of TGT common stock and the assumption by HDN of certain of Old Heyden's liabilities. After the transaction, HDN changed its name to "Heyden Newport Chemical Corporation" ("Heyden Newport") and filed and recorded in Delaware a change of name amendment on October 4, 1963. At the same time, Old Heyden changed its name to "Denport Corporation" and dissolved"" (2019 Letter, p. 2).

On December 15, 1982, Tenneco Chemicals and Tenneco Polymers entered into an agreement whereby Tenneco Chemicals transferred certain assets to Tenneco Polymers. Pursuant to that agreement, Tenneco Chemicals did not transfer any liabilities related to the Garfield Site, and any transfer of liabilities was limited to litigations and claims known or existing at the time of the conveyance—and expressly

referenced in exhibits consisting of litigation dockets generated at the time of the transaction. In 1983, Tenneco Chemicals changed its name to Tenneco Resins, Inc. ("Resins"), and filed for dissolution two years later, in 1985. Tenneco Polymers changed its name to EPEC Polymers, Inc. in 1996, shortly following El Paso Merger Company's acquisition of the energy assets of Tenneco Inc. As the aforementioned facts demonstrate, at no time did Tenneco Polymers merge or consolidate with Resins. In addition, Tenneco Chemicals was a separate corporation from Tenneco Polymers with assets and operations. Although Tenneco Chemicals was a party to various asset transfers over the course of its corporate existence, it retained any and all liabilities associated with the Garfield Site, and those liabilities ceased to exist upon its dissolution in 1985."

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

ESSEX CHEMICAL CORPORATION

Facility Name, Address and Size: Essex Chemical Corporation (Essex); 330 and 352 Doremus Avenue, Newark, New Jersey; 15 acres (PAP-00116509).

In 1989, the Essex property was bordered to the south by Hoechst-Celanese Corporation, to the north by Quantum Chemical Corporation and the Nimco commercial bus crushing facility, to the northeast and west by steel scrap salvage yards, and to the west by vacant property owned by the Housing Authority of the City of Newark and leased by the Waterside Urban Renewal Development Corporation. Conrail owned and maintained a 35-foot wide strip of land which ran parallel to Doremus Avenue adjacent to the eastern yard of the Essex facility (PAP-00116863).

1. **Business Type:** Manufacturer of sulfuric acid and related inorganic products (PAP-00116859)

2. **Time Period of Ownership/Operations**

330 Doremus Avenue	352 Doremus Avenue
Operator: 1956 to 1989	**Operator:** 1965 to 1989
Owner: 1955 to 1989	**Owner:** 1965 to 1989

1953: Dixon Chemical and Research, Inc. (DCR), a successor to Dixon Chemical, Inc., was established in 1953 (PAS-00061383).

1955/1956: DCR acquired the 330 Doremus Avenue property from Reilly Industries (at the time, known as Reilly Tar and Chemical Corporation), erected a sulfuric acid plant, and began operating in 1956 (PAP-00115992).

1962: DCR changed its name to Essex on June 20, 1962 (PAS-00061383).

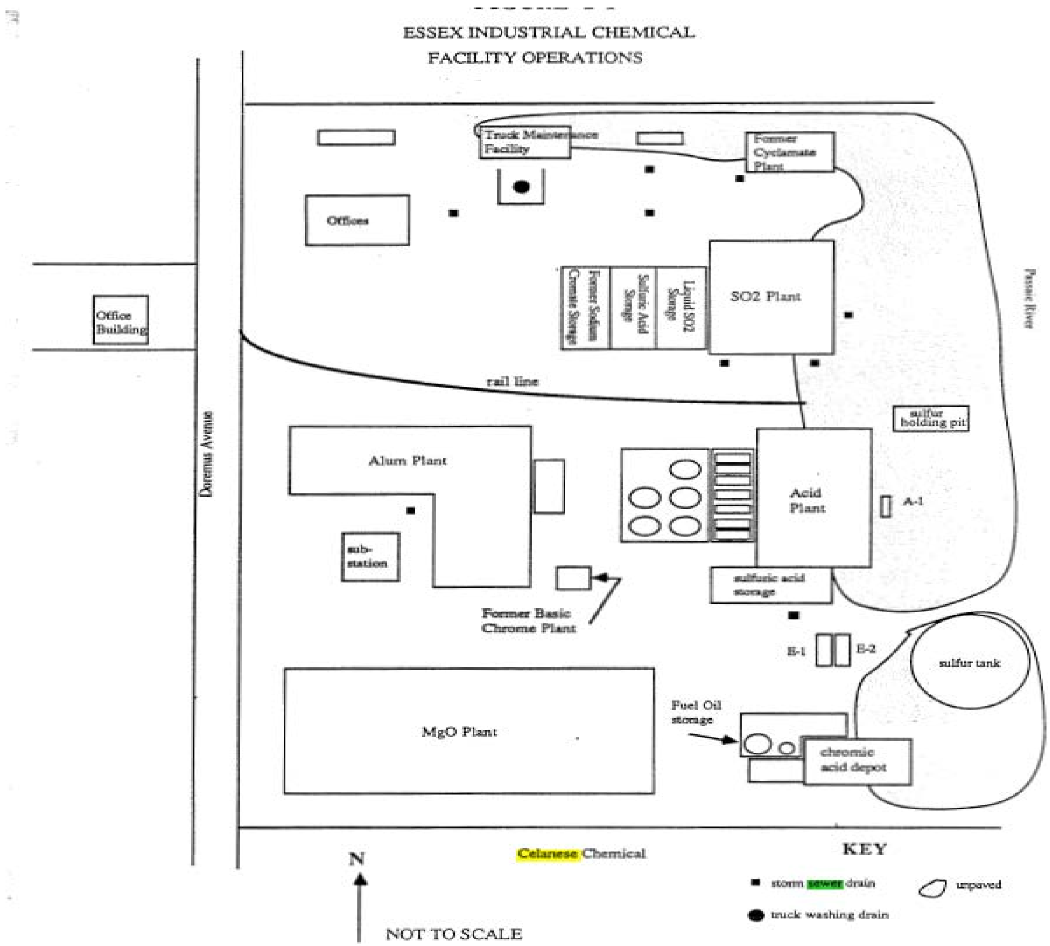
1965: Essex bought the 352 Doremus Avenue property from 352 Doremus Avenue Co., Inc. on June 25, 1965 (PAP-00115993).

~1982: Essex Industrial Chemicals, Inc. (Essex Industrial) was formed, and operated as a wholly-owned subsidiary of Essex (PAS-00061379).

1988: Dow Chemical Company acquired all the issued and outstanding stock of Essex in October 1988 (PAP-00116862).

1989: Essex sold the stock of Essex Industrial to Peridot Chemicals (New Jersey), Inc. (Peridot) on December 22, 1989 (PAP-00116862).

Note: Pan Am Sulfur Company leased one-half acre in the northeast corner of 352 Doremus Avenue from April 6, 1962 to March 31, 1970 on which it operated a large tank for the storage of molten sulfur (PAP-00115993).



(PAP-00115991)

Essex's manufacturing operations were situated on the east side of Doremus Avenue and administrative operations were conducted on the west side of Doremus Avenue (PAP-00115990).

3. Operational History/COC Use and Presence at the Facility

Essex manufactured industrial chemicals, including sulfuric acid, oleum, liquefied sulfur dioxide, and aluminum sulfate; warehoused chromium and phosphate chemicals; and operated a magnesium oxide regeneration plant for the Philadelphia Electric Company (PAP-00115988).

Available documents do not include information that Essex manufacturing processes entailed the use, storage, handling, or generation of Operable Unit 2 (OU2) contaminants of concern (COCs) (PAP-00115988; PAP-00115990; PAS-00061379, 81). According to a 1989 Essex Industrial Chemicals Newark Facility Hazardous Substance/Waste Inventory sheet, 15 pounds of mercury was present in the laboratory in 1989 (PAP-00116301).

4. Identified COCs

- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (used and detected)

PAHs

According to a Phase I ECRA Sampling Plan Results and Phase II Sampling Proposal, dated February 28, 1990 (1990 Phase I ECRA), total petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) were the primary organic constituents found at concentrations above the New Jersey Department of Environmental Protection's (NJDEP's) "informal ECRA [Environmental Cleanup Responsibility Act] action levels" in on-site soil. According to the 1990 Phase I ECRA, the extent of these substances appeared to be limited to an acid plant boiler area and a truck maintenance building area (PAP-00116505). The 1990 Phase I ECRA states that a suite of 5-10 PAHs were consistently identified in many of the soil samples analyzed (PAP-00116562).

The 1990 Phase I ECRA states that in some sample locations, PAH concentrations were found to increase with depth, especially in the eastern areas of the plant near the former underground tank locations. However, the 1990 Phase I ECRA also stated that in other areas, PAHs concentrations "appeared randomly with no apparent vertical distribution" (PAP-00116562). The 1990 Phase I ECRA states that, while these compounds may have originated from former Essex operations [e.g., leaks from fuel oil (No. 6) tanks or asphalt], "it is believed that historical operations at the site prior to Essex ownership may have also contributed to the levels found" (PAP-00116505, 562, 606).

According to the Phase II ECRA Sampling Plan Results and ECRA Cleanup Plan Proposal, dated April 1991 (1991 Phase II ECRA), several PAHs were detected in soil (PAP-00116908-10). Detections were identified at maximum concentrations that exceeded the calculated "RCRA [Resource Conservation and Recovery Act] Action Level" identified in the report (PAP-00116998-99). PAHs were reported at the following maximum concentrations (note that parts per million [ppm] is equivalent to mg/kg):

- Benzo(a)anthracene – up to 62 ppm
- Benzo(a)pyrene – up to 37 ppm
- Benzo(b)fluoranthene – up to 110 ppm
- Benzo(k)fluoranthene – up to 98 ppm
- Dibenzo(a,h)anthracene – up to 4 ppm
- Indeno(1,2,3-cd)pyrene – up to 26 ppm (PAP-00116999)

The following represents a complete table of samples with PAH concentrations exceeding calculated soil cleanup levels for the "Direct Contact Pathway":

Chemical	Direct Contact Action Level (mg/kg)	Phase II Soils: Soil Sample	Phase II Soils: Concentration (mg/kg)	Phase I Soils: Soil Sample	Phase I Soils: Concentration (mg/kg)
SVOAs					
chrysene	7.02E+01			AP-8C	8.50E+01
benzo(b)fluoranthene	2.22E+00	Q-3 (3.5-4)	4.10E+00	AP-6C	5.40E+00
				AP-7B	5.10E+00
				AP-8C	1.10E+02
				AP-9A	3.40E+00
				AP-11C	7.10E+00
				MGO-2B	1.20E+01
				TF-2	1.40E+01
				TF-5	2.50E+00
				CPP-1A	2.50E+00
				CPP-1C	2.30E+00
				CPP-3B	7.20E+00
				BK-1	5.30E+00
benzo(k)fluoranthene	4.72E+00			AP-8B	9.80E+01
benzo(a)pyrene	3.11E-01	TMB-2 (4-4.5)	9.10E-01	AP-6C	1.90E+00
		Q-1 (3.5-4)	9.90E-01	AP-7B	1.60E+00
		Q-3 (3.5-4)	2.50E+00	AP-8B	3.70E+01
		Q-4 (replacement)	4.90E-01	AP-8C	1.10E+01
		APS-1 (5.5-6)	3.30E-01	AP-9B	3.70E-01
		APS-5 (3.5-4)	3.20E-01	AP-11B	1.30E+00
		CP-5 (4-4.5)	4.20E-01	AP-11C	2.30E+00
		CP-7 (7.5-8)	1.10E+00	MGO-2B	3.00E+00
		CP-9 (4-4.5)	3.60E-01	E-3	7.60E-01
		CP-13 (5.5-6)	4.00E-01	TF-1	4.80E-01
		ALUM-1 (5.5-6)	9.20E-01	TF-4	4.10E-01
		ALUM-2 (3.5-4)	7.60E-01	CPP-1A	5.80E-01
		BC-7 (3.5-4)	7.10E-01	CPP-1B	1.40E+00
		BC-7 (5.5-6)	7.90E-01	CPP-1C	6.20E-01
		APS-6 (3.5-4)	7.40E-01	CPP-2A	1.20E+00
		APS-7 (5.5-6)	3.80E-01	CPP-3B	1.50E+00
		APS-10 (3.5-4)	1.80E+00	BK-1	2.50E+00
		APS-13 (5.5-6)	5.00E-01		
		ST-2 (3.5-4)	4.10E-01		
benzo(a)anthracene	2.14E+00	Q-3 (3.5-4)	2.70E+00	AP-7B	2.20E+00
				AP-8B	3.50E+01
				AP-8C	6.20E+01
				AP-8D	7.00E+00
				AP-11C	4.50E+00
				MGO-2B	8.20E+00
				TF-2	6.60E+00
				CPP-1B	3.50E+00
				CPP-2A	2.20E+00
				CPP-3B	3.30E+00
				BK-1	3.90E+00
dibenzo(a,h)anthracene	2.80E-01	CP-7 (7.5-8)	3.20E-01	AP-8C	4.00E+00
		APS-10 (3.5-4)	4.10E-01	AP-8D	3.50E-01
				AP-11C	6.10E-01
				MGO-2B	7.20E-01
				TF-2	3.50E-01
indeno(1,2,3-cd)pyrene	1.34E+00	APS-10 (3.5-4)	1.40E+00	AP-8B	1.70E+01
				AP-8C	2.60E+01
				AP-8D	2.50E+00
				AP-11C	1.60E+00
				MGO-2B	2.00E+00
				TF-2	2.60E+00
				BK-1	1.90E+00
benzo(g,h,i)perylene	1.42E+01			AP-8B	2.10E+01
				AP-8C	2.40E+01

(PAP-00117022)

Copper

According to the 1991 Phase II ECRA, copper was detected in site soil at a maximum concentration of 150 ppm at location TMB-3, at a depth of 4-4.5 feet below ground surface (bgs). This sample was described as “black sandy fill” in its boring log (PAP-00116912; PAP-00117390). Copper was detected in 9/9 samples collected (PAP-00116999).

Lead

According to a Memorandum: Responsible Party Investigation, received on April 3, 1991, the Division of Environmental Quality, Right to Know Survey states that Essex Industrial used several chemicals, including lead (PAP-00031631). Review of the available file material did not identify any other documentation of lead use.

According to the Phase II ECRA Sampling Plan Results and ECRA Cleanup Plan Proposal, prepared for Essex, dated April 1991, lead was detected in site soil at a maximum concentration of 7,000 ppm in sample Q-3 (3.5-4 ft bgs), within the Quantum Chemicals Property Area (PAP-00116922). Lead was also detected in several locations within the Truck Maintenance Building, including TMB-2 (4-4.5 ft bgs) at 100 ppm and TMB-4 (6.5-7 ft bgs) at 2,000 ppm. Additional detections were identified in the Chrome Sulfate and Chemical Unloading Area at location CR-4 (5-5.5 ft bgs) at 3,000 ppm (PAP-00117022). Lead exceeded the NJDEP ECRA “Action Level” identified in the report (PAP-00116922). Lead was detected in 9 out of 9 samples collected (PAP-00116999). Review of soil boring logs for the referenced sample locations shows that fill was identified at these locations (PAP-0017386, PAP-00117430, PAP-00117430).

A Remedial Action Report, dated September 2, 1994 (1994 Remedial Action Report) noted that lead was identified exceeding NJDEP cleanup levels in the Chromium Area. Following excavation, the confirmation samples collected were below cleanup criteria. The maximum concentration reported was 700 ppm at sample location CA-3 (PAP-00117542).

Mercury

According to the 1991 Phase II ECRA, mercury was detected in site soil at a maximum concentration of 7 ppm, at CR-4, at a depth of 5-5.5 feet bgs, beneath “coal fragments”. Mercury exceeded the NJDEP ECRA “Action Level” identified in the report and was detected in 9 out of 9 samples collected (PAP-00116999; PAP-00116932; PAP-00117430).

A 1989 Essex Industrial Chemicals Newark Facility Hazardous Substance/Waste Inventory sheet noted that 15 pounds of mercury were stored in a laboratory (PAP-00116301).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[1]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to the 1990 Phase I ECRA, total petroleum hydrocarbons and PAHs were the primary organic constituents found at concentrations above NJDEP's "informal ECRA action levels" in on-site soil. The 1990 Phase I ECRA states that the extent of these substances appeared to be limited to an acid plant boiler area and a truck maintenance building area and that a suite of 5 to10 PAHs were consistently identified in many of the soil samples analyzed (PAP-00116505; PAP-00116562). According to the report, in some sample locations, PAH concentrations were found to increase with depth, especially in the eastern areas of the plant near the former underground tank locations. However, the report also stated that in other areas, PAHs concentrations "appeared randomly with no apparent vertical distribution" (PAP-00116562). The 1990 Phase I ECRA states that, while these compounds may have originated from Essex operations [e.g., leaks from fuel oil (No. 6) tanks or asphalt], "it is believed that historical operations at the site prior to Essex ownership may have also contributed to the levels found" (PAP-00116505, 562, 606).

The 1991 Phase II ECRA, states that "Soil (fill material) quality is impacted primarily by elevated levels of TPHCs [total petroleum hydrocarbons], BNs [Base/Neutral-Extractable organic compounds, which can include PAHs], and chromium. Although Essex has handled compounds containing these constituents, the widespread nature is believed partly attributable to combustion residues (coal, slag, cinders) deposited during the early development of the site and to historical operations by previous site owners" (PAP-00116859).

According to an ECRA Site Evaluation Submission, dated January 31, 1989 (1989 ECRA Site Evaluation), the facility is constructed on approximately 12-15 feet of man-made fill materials overlying former salt marsh deposits (PAP-00115999). The unconsolidated man-made fill at the site reportedly consists of rubble, construction debris, cinders, and varying amounts of silt and gravel (PAP-00116000). According to a

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[2] Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils (2002) and Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] NJDEP, N.J.A.C. 7:26E Technical Requirements for Site Remediation, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated Historic Fill Technical Guidance (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Declaration of Environmental Restrictions, originally recorded on June 27, 1997, lead and PAHs, among other chemicals, are stated to be present in the Historic Fill (PAP-00116198; PAP-00116206-07). A review of available documents did not provide any evidence of disturbance of Historic Fill at the facility. As discussed in the 1994 Remedial Action Report, soil removed to address onsite contamination "appeared to consist primarily of fill material mixed with some construction debris. The fill was dark brown to black and consisted primarily of cinders and construction debris in a silty clay matrix. In general the debris consisted of brick, concrete, and wood" (PAP-00117522).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00116999).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	7,000 mg/kg
Copper	150 mg/kg
Mercury	7 mg/kg
Benzo(a)anthracene	62 mg/kg
Benzo(a)pyrene	37 mg/kg
Benzo(b)fluoranthene	110 mg/kg
Benzo(k)fluoranthene	98 mg/kg
Dibenzo(a,h)anthracene	4 mg/kg
Indeno(1,2,3-cd)pyrene	26 mg/kg

A review of available documents did not provide any evidence of disturbance of Historic Fill.

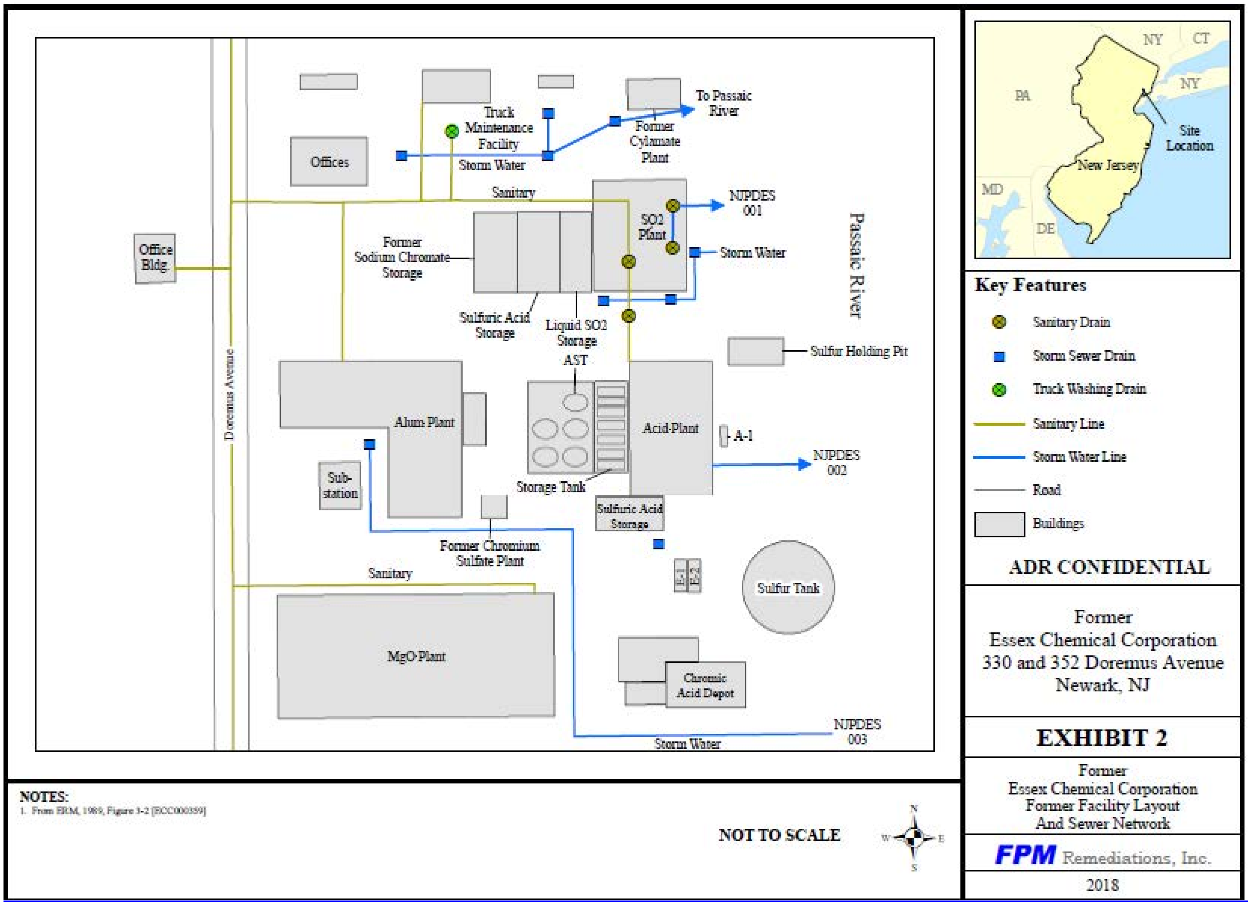
5. COC Pathways

Sanitary Sewer

Essex discharged all sanitary wastes from the facility and process effluent from the magnesium oxide regeneration operation, and wash water from a truck washing area to the PVSC system, pursuant to Sewer Connection Permit No. 20402313 (PAP-00116000; PAP-00116184). The ECRA Site Evaluation Submission, Request for Hydrogeological Assessment Facility Sampling Plan dated January 1989 (the 1989 Facility Sampling Plan) states that truck wash water was discharged from 1956-1987 (PAP-00115970).

Storm Sewer

Non-contact cooling water and condensate water associated with production of liquefied sulfur dioxide, along with storm water runoff, was discharged to the Passaic River via three outfalls pursuant to the New Jersey Pollutant Discharge Elimination System (NJPDES) Permit No. NJ0002283 (PAP-00115965, 5970, 5988-5989, 5970; PAP-00116075, 6102; PAP-116324; PAP-00117660).



(PAP-00116339)

Direct Release

There is no information regarding direct releases in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

According to a Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor, dated November 1969, the New Jersey State Department of Health issued “pollution abatement orders” to Essex (PAP-00140967). The reason for the order, including associated contaminants, is not specified in available file material.

Releases to the Passaic River from Essex were reported in 1972 and 1983; however, none of the releases involved OU2 COCs (PAS-00014546; PAS-00062738, 745).

Criminal charges were filed against Essex in United States District Court, District of New Jersey on July 11, 1974, arising from a 1972 release to the Passaic River from Essex (PAS-00062740). The charges were brought against Essex for "the unlawful discharge into the Passaic River of refuse matter, including acid and acid solutions" (PAS-00062738). As described by a PVSC inspector, a 20,000 gallon tank car with oleum and nitric acid overflowed through a vent pipe due to internal pressure. The ground was covered with soda ash and water to neutralize the overflow, and the fire department then washed the residue into the Passaic River (PAS-00062745).

Inspections

On May 2, 1974, PVSC inspected the facility and collected samples from their outlets for a routine inspection. Analysis revealed that a yard drain outlet "was polluting." The inspector contacted Essex and investigation revealed that some truckers, "despite orders to the contrary," had washed some trucks over a yard catch basin. To prevent this from recurring, it is reported that the yard catch basin in the truck area was plugged and the washing of trucks was moved to an area "whereby the waste enters the sanitary sewer (PAS-00034881)". No citations were noted in the provided sources.

Violations

There is no information regarding violations in the available file material.

Permits

From 1956 to 1989 non-contact cooling water and storm water were discharged without treatment; truck wash water was discharged and treated by PVSC from 1956 to 1987; and magnesium oxide plant effluent was discharged to PVSC from 1982 to 1989 (PAP-00115970).

Essex had three NJPDES permitted discharges to the Passaic River from 1956 to 1989: NJDEPS Permit No. NJ0002283 was issued for discharge into the Passaic River, with an issue date of September 2, 1988 and expiration date of October 31, 1993 (PAP-00115965, 5970) Outfalls No. 001 discharge included noncontact cooling water, boiler blowdown, and storm water runoff; Outfall No. 002 discharge included non-contact cooling water and storm water runoff; and, Outfall No. 003 discharge included non-contact cooling water from the magnesium oxide plant (PAP-00116116, 6118, 6120; PAP-00116283).

The NJPDES Permit No. NJ0002283 Summary Table lists monitoring of copper, among other chemicals (PAP-0016116-6121); however, copper was only required to be monitored if a corrosion inhibitor containing this metal was used for water treatment purposes (PAP-00116118). Review of discharge monitoring reports shows that Essex did not monitor for copper (PAP-00116139-83). Per a Public Notice regarding issuance of Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey, dated 1982, copper effluent was allowed a maximum limit of 1.0 milligrams per liter (mg/L) at a required monthly monitoring frequency for Outfalls No. 001, No. 002, and No. 003 (PAP-00116117, PAP-00116119, PAP-00116120).

PVSC Sewer Connection Permit No. 20402313 was issued and effective September 18, 1985 and expired September 13, 1990 (PAP-00116184). No monitoring related to OU2 COCs was required (PAP-0011686-89).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- ECRA Site Evaluation Submission, Essex Industrial Chemicals, Inc., Volumes 1 and 2 (January 31, 1989) (PAP-00115963-00116495)
- Phase I ECRA Sampling Plan Results and Phase II Sampling Proposal for Essex Chemicals Corporation (February 28, 1990) (PAP-00116496-PAP00116846)
- Phase II ECRA Sampling Plan Results and ECRA Cleanup Plan Proposal, Essex Chemical Corporation, Volumes 1 and 2 (April 1991) (PAP-00116847-7464)
- Remedial Action Report (September 1994) (PAP-00117511-644)

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

As discussed in the 1990 Phase I ECRA and 1991 Phase II ECRA reports, the Essex property underwent two phases of an ECRA Site Investigation. According to a 1994 Remedial Action Report, soils at this facility were found to contain PAHs and lead, among other chemicals. As a result, remedial actions were conducted to achieve the NJDEP "non-residential cleanup levels" for contaminated soils at the site and approximately 2,525 tons of soil and debris were removed from five on-site excavations and one off-site excavation (PAP-00117516). Because of the presence of chromium, zinc, and total petroleum hydrocarbons in soil, along with Historic Fill containing PAHs and lead, among other metal contaminants, a Declaration of Environmental Restrictions, originally recorded on June 27, 1997, was approved by NJDEP as a remedial measure and placed on the site in 1997 to restrict the use of the site to non-residential (PAP-00116197-98).

On June 30, 1997, NJDEP issued a "no further action" approval letter for the site and established a "Classification Exception Area" designation for a portion of the site "because levels of contaminants remain above their Ground Water Quality Criteria pursuant to the Ground Water Quality Standards (N.J.A.C. [New Jersey Administrative Code] 7:9-6.1 et seq.) and/or Primary Drinking Water Standards (N.J.A.C. 7:10), respectively" (PAP-00116195). These contaminants included lead and copper, among others (PAP-00117468).

Remedial Activities

A 1994 Remedial Action Report noted that lead was identified exceeding NJDEP cleanup levels in the Chromium Area. Following excavation, the confirmation samples collected were below cleanup criteria. The maximum concentration reported was 700 ppm at sample location CA-3, which was below the NJDEP non-residential soil cleanup criteria and no action was required (PAP-00117540-42). .

8. Summary of Asserted Defenses

Essex Chemical Corporation asserts that, "Essex is not a person responsible for the release of COC's pursuant to the decision in CDMG Realty Co., et al. v. the Sharkey Landfill Agreement Group, 96 F. 3d. 706 (3rd Cir. 19946).

COCs detected at the former Essex property, other than minor petroleum spills, were exclusively from Historic Fill which was placed at the property well before Essex' acquired it by parties unconnected to Essex.

In addition, any PAHs on site which may have resulted from tank or pipe leakage were contained in fuel oil and are subject to the petroleum exclusion under CERCLA. Any contaminants emanating onto the site from off-site sources are subject to the CERCLA contiguous property exception".

EVERETT SMITH GROUP LTD.

Facility Name, Address and Size: Everett Smith Group Ltd. (ESG) as successor to Blanchard Bro & Lane, 20 Bruen Street, Newark, New Jersey; 4.21 acres (PAS-00032776).

1. **Business Type:** Leather tannery (PAP-0044885).

2. **Time Period of Ownership/Operations**

Operator: 1937 to 1939
Owner: 1937 to 1941

Note: A company by the name of Blanchard Bro. appears in City of Newark directories at 20 Bruen street in 1872, 1874, and 1939 (PAS-00032777, -814).

However, it appears that there have been two Blanchard Bro. & Lane companies. One that was incorporated in 1887 ("Blanchard 1887") to operate a leather tannery at 20 Bruen Street and ceased to exist in 1937 pursuant to the terms of its 50-year incorporation certificate (PAP-00000009); and another incorporated in 1937 ("Blanchard 1937") operating a leather tannery at the same location incorporated in 1937 (PAP-00000053). The names of two officers of Blanchard 1887, H. Gay Crawford and Joseph H. Gay, are consistently listed as of two of the officers of Blanchard 1937 (PAS-00032899-900; PAP-00000052; PAP-00000010-14).

The corporate history of the Blanchard Bro. & Lane companies is as follows:

1887: An entity named Blanchard Bro. & Lane was incorporated (PAP-00000052). The New Jersey Secretary of State "List of Certificates" dated December 31, 1911 states that Blanchard 1887 was not given a "perpetual" existence when incorporated, but rather had a legal existence limited to 50 years (PAP-00000005-6).

Blanchard 1887 purchased the 20 Bruen Street property by a deed recorded on January 6, 1888 (PAP-00000039).

1937: The 20 Bruen Street property was sold by Blanchard 1887 to Frank Deckert (PAP-00000047-52). This sale was accompanied by a stamp of the common seal of "Blanchard Bro. & Lane, Incorporated 1887" (PAP-00000052).

Blanchard Bro. & Lane was incorporated (hereinafter "Blanchard 1937") on June 29, 1937 (PAP-00000007).

Frank Deckert sold the 20 Bruen Street property to Blanchard on July 1, 1937 (PAP-00000053) (describing, "Blanchard Bro. & Lane" as "a corporation of the State of New Jersey (organized 1937). Blanchard 1887's corporate existence terminated November 11, 1937, according to the terms of its charter (PAP-00000005-6).

1939: The last year in the available source documents that Blanchard Bro. & Lane was listed in the City of Newark directories for 20 Bruen Street (PAS-00032814).

1941: The 20 Bruen Street property was sold to Ironbound Land Development Company on December 26, 1941 (PAP-00000058).

1961: A 1961 letter from Warner, Norcross, and Judd Attorneys states that Eagle Ottawa Leather owns all of the "issued and outstanding stock of Blanchard 1937 (PAP-00432364-65).

1964: A liquidation plan was adopted to accomplish the dissolution of Blanchard 1937 on August 31, 1964. Eagle Ottawa Leather assumed all of Blanchard's debts, obligations and liabilities on that day (PAP-00432366-67; PAP-00432368). Blanchard 1937 was dissolved on February 24, 1965 (PAS-00032820).

1966: Articles of Merger for Eagle Ottawa Leather Company and Albert Trostel & Sons are dated December 19, 1966 (PAS-00032908-09).

2007: On May 15, 2007, Everett Smith Group Ltd. acquired Albert Trostel & Sons Co (PAS-00032797).

There is no information in the available files of a direct transaction between Blanchard 1887 and Blanchard 1937. Blanchard 1937 purchased the real estate at issue from an individual who had acquired it from Blanchard 1887. No information is available regarding the shareholders of Blanchard 1887 and Blanchard 1937 in 1939. The information available with respect to any overlap of officers of Blanchard 1887 and Blanchard 1937 is summarized below and states that two individuals, H. Gay Crawford and Joseph H. Gay, were associated with Blanchard 1887 and Blanchard 1937.

- The New Jersey Secretary of State "List of Certificates" dated December 31, 1911, lists the Agent of Blanchard Bro and Lane as Matthew T. Gay (PAP-00000006).

- According to *Newark, the City of Industry,* a 1912 publication of the Board of Trade of the City of Newark, Matthew T. Gay, had been with Blanchard Bro & Lane nearly a half century, was president, and his sons Joseph H. and Herbert S. Gay held the positions of secretary and treasurer (PAS-00032773, 899-900).

- The Treasurer listed on the sale of the facility in 1937 to Frank Deckert is listed as Herbert S. Gay and the Secretary is listed as H. Gay Crawford (PAP-00000052).

- A Certificate of Amendment dated December 28, 1939, lists the President of Blanchard Bro & Lane as Joseph H. Gay and the Secretary as H. Gay Crawford (PAP-00000010-14).

- The 1941 deed to Ironbound Land Development Company from Blanchard Bro and Lane was signed by Karl Koeniger, Vice President and H. Gay Crawford as Secretary (PAP-00000058-63).

3. Operational History/COC Use and Presence at the Facility

The operations at this facility involved tanning and finishing of leather (PAS-00032775-816; PAS-00032899-900). There are no facility records available. Information from other sources are provided below regarding the typical operations of leather tanning facilities and information available from Sanborn maps of the area.

An industrial health hazard survey done in Ohio in 1915 included an assessment of the leather tanning and dyeing industry. At the time, this involved clearing the hides with sulfuric acid and bleaching with lead acetate, as well as tanning with chromium. Hides also contained arsenic from preservatives and from arsenic sulfide added to the lime used in unhairing. This survey also states that in the leather coloring and japanning houses, lead-containing dye and aniline dyes were being used. Additionally, benzene was in use as a solvent and mottling was done with a solution made up of naphtha, amyl acetate and wood alcohol. White lead, lamp black, oil, ferrous sulphate, tannic acid, and logwood were in use at various locations to produce the leather coloring agents (PAS-00032841-45). This survey did not discuss the nature or content of any wastewater effluent generated through leather tanning and dyeing operations.

A 1922 book regarding leather manufacturing discusses wastes from tanneries and states that wash waters in large volumes contained undissolved or suspended solids which, when removed left practically pure water.[1]

A Sanborn map from 1926-1931 shows a section of the facility was used for Japanning and describes Blanchard Bro. as producing “patent enameled & fancy colored leather.” It also shows an underground naphtha tank and two coal storage buildings (PAS-00032816-18).

General references from the 1940s regarding leather tanning show the use of materials including naphtha, chrome, calcium sulfate, and linseed oil to process the hides, and carbon black, Prussian blue (ferric oxide and cyanide), raw umber (iron oxide and manganese oxide) and litharge (lead oxide) to finish it.[2] Copper and zinc may also have been used in the finishing process (PAS-00032852-53).

According to a 1967 Department of Interior report entitled *The Cost of Clean Water-Industrial Waste Profiles No. 7 - Leather Tanning and Finishing*, leather tanning generally involves the steps presented below, although the specifics may have changed over time. There are ten major steps in the tanning and finishing process:

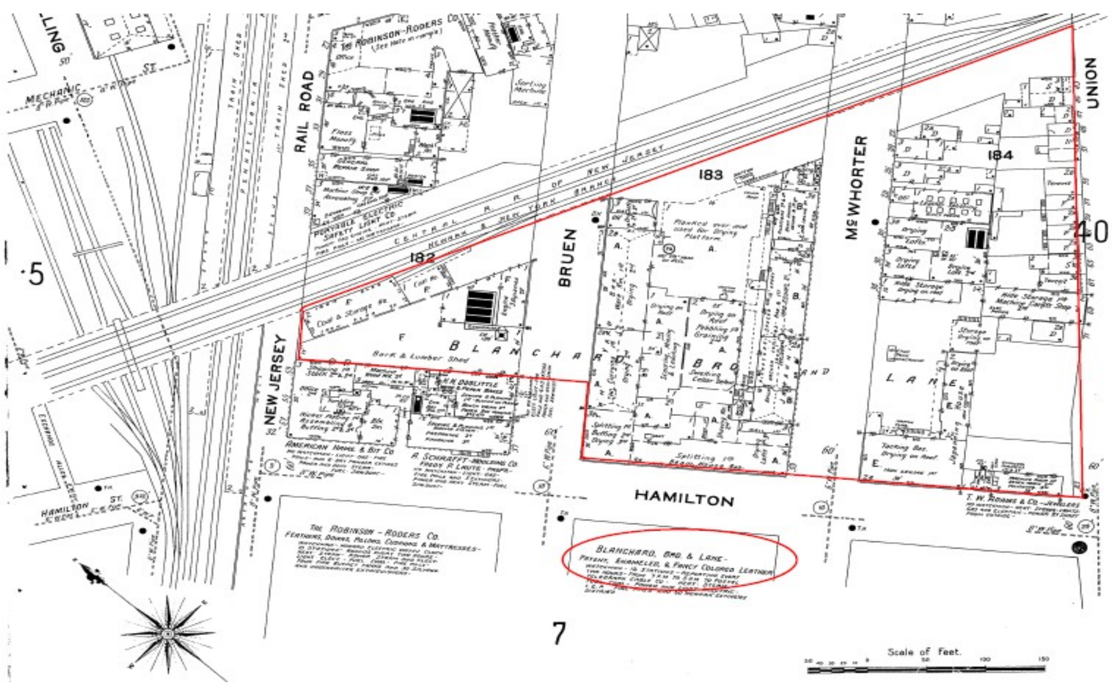
1. Shipping, storing & trimming
2. Soaking & washing (to remove salt, blood and dirt)
3. Green fleshing (to improve chemical penetration for later steps)
4. Unhairing (to improve appearance and remove unwanted protein)
5. Lime splitting (to separate the valuable grain layer from the flesh layer)
6. Bating (the first process in the tanhouse, to improve the feel of the grain)

[1] Rogers, A. (1922). *Practical Tanning*. New York, NY: Henry Carey Baird & Co., Inc. (pp. 665-666).
[2] Wilson, J. A. (1941). *Modern Practice in Leather Manufacture*. New York, NY: Reinhold Publishing Corporation. (pp. 607-613).

7. Pickling (to prevent precipitation of chromium salts during tanning)
8. Degreasing (to remove grease from sheep, pig or goat hides)
9. Tanning (to convert the hides into leather)
10. Retan-color-and-fatliquor processes (to ensure excellent leather and desired appearance) (PAS-00032773, 824-25).

The "significant pollutants" from a tannery identified in the 1967 Department of the Interior report were "1) free lime; 2) high pH; 3) potentially toxic chromium; 4) high BOD: 5) high suspended solids (hair and fleshings; 6) milky color from lime or green-brown color from tanning; 7) hardness; 8) high sulfides" (PAS-00032826). This list does not include any of the Lower Passaic River COCs.

ESG retained Steven Lange, an expert on the leather tanning process, to review the relevant information in the submission of information in a related State litigation, conduct his own research, and apply his own expertise to opine on the likelihood that any of the OU 2 COCs would have been a constituent in the wastewater effluent produced by the Blanchard 1937 manufacturing process. He has concluded that it is highly unlikely, given the period in which the manufacturing occurred and the type of products reported to have been manufactured at the Blanchard 1937 tannery, that any of the OU2 COCs would have been a part of the facility's effluent (Early Settlement, p. 3). In a supplemental letter report dated September 7, 2018, Mr. Lange stated that the "observations and conclusions made with respect to operation of the tannery and the potential for discharge of Contaminants of Concern to the facility waste water from 1937 to 1939 apply equally to its operation and discharges to waste water prior to 1937" (Steven Lange Letter to Linda Benfield dated September 7, 2018).



(PAS-00032816)

4. Identified COCs

- Lead (possible use)
- Copper (possible use)

No records regarding facility operations during the relevant time-period were identified and provided by ESG. The possible use of these chemicals is taken from the description of leather tanning methods above.

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.[3]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[4] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[5] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[6]

There is no information regarding analytical data in the available file material.

5. COC Pathways

Sanitary Sewer

After the establishment and operation of the PVSC system in 1924, the facility would have discharged to the City Dock CSO district (PAS-00032870; PAS-00032915). However, no information documenting the volume or content of wastewater discharged from the facility was identified and no such records have been found from public sources as reported by ESG (PAP-00432360).

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[3] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[4] Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils (2002) and Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[5] NJDEP, N.J.A.C. 7:26E Technical Requirements for Site Remediation, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated Historic Fill Technical Guidance (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[6] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The overflow chamber for the City Dock CSO district is "on the east side of intersection of Raymond Blvd. and Raymond Plaza East." The district is served by one 108" x 90" rectangular concrete sewer outfall to the Passaic River. A PVSC report states that this outfall served as the wet-weather overflow point for sewers within the district when the volume of combined flow was more than the system could handle. It states that "Under normal dry weather flow conditions, the flow is diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow enters the interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River" (PAS-00032869-70).

Storm Sewer

There is no information regarding storm sewers in the available file material.

Direct Release

There is no information regarding direct release in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations and Enforcement Actions

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

Characterization Activities

There is no information regarding characterization activities in the available file material.

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

There is no information regarding soil sampling in the available file material.

Remedial Activities

There is no information regarding remedial activities in the available file material.

8. Summary of Asserted Defenses

Everett Smith Group Ltd. asserts that, "ESG has no connection to or responsibility for Blanchard 1887's ownership and operation of the Facility prior to May 3, 1937". ESG states that, mere "substantial continuity" of business is no basis for successor liability under CERCLA. Rather a "de facto merger" must be proven which requires, among other things, an assumption of seller's liability.

Additionally, Blanchard 1937 was dissolved in 1965 by the corporation that owned its stock at that time, Eagle-Ottawa Leather Company (PAS-00032820). In anticipation of such dissolution, Eagle Ottawa Company assumed on August 31, 1964, all existing fixed and contingent debts, obligations and liabilities of Blanchard 1937 (PAP-00432366-67; PAP-00432368). There was no merger of the Blanchard 1937 and Eagle Ottawa Leather Company corporate entities (PAP-00432366-67; PAP-00432368). Since there was no assumption of Blanchard 1937 debts, obligations, or liabilities that did not exist on August 31, 1964, and no merger of Blanchard 1937 and Eagle-Ottawa Leather Company, Everett Smith Group asserts that it could have no liability for any potential CERCLA liabilities associated with the dissolved Blanchard 1937 that may have arisen with the enactment of CERCLA in 1980.

FOUNDRY STREET CORPORATION

Facility Name, Address and Size: Foundry Street Corporation (Foundry); 185 Foundry Street, Newark, New Jersey; 9.4 acres (PAS-00044626). Available references did not include information on the number of employees and work shifts at Foundry.

1. **Business Type:** This property has been a multitenant facility.

2. **Time Period of Ownership/Operations**

   Owner: Foundry Street Corporation – 1970-At least 2006 (PAS-00109628-9; PAS-00114494)

   Foundry Street Corporation was started in 1970 and incorporated in the State of New Jersey as of April 14, 1971 (PAS-00114494; PAS-00109628). Various tenants operated at the Foundry Street Complex. Some are shown on the map on the next page.

   A subdivision of Lot 4 Block 5005 was approved by the City of Newark, and consequently, Lot 22, 159-169 Foundry Street was formed from the southern portion of Lot 4. Kem Realty Company conveyed this new parcel containing approximately 1.65 acres to the Foundry Street Corporation on May 3, 1971. The property was leased to Automatic Electroplating Corporation, Sun Chemical Corporation and Fleet Auto Electric (PAS-00044990).

   Foundry Street Corporation was an active corporation in New Jersey in 2006 (PAS-00114782).

   According to a letter July 1990 letter from a law firm to NJDEP, Foundry Street Corporation was planning to sell a portion of 185 Foundry Street to Sun Chemical consisting of a single building at the northwestern corner (PAP-00117800-2).

3. **Operational History/ COC Use and Presence at the Facility**

   The numerous chemical companies and other entities that operated at the Foundry Street Complex after 1960 include the following:

   - ABC Demolition Company (contractor)
   - Ace Chemical Corporation
   - Ashland Chemical Company (bulk chemical repackaging; See Ashland Data Report)
   - Automatic Electro-Plating Corporation (plating; See AEP Data Report)
   - Avon Drum Corporation (drum washing; known Aroclor 1248 soil detections)
   - Berg Chemical Company, Inc. (chemical repackaging)
   - Conus Chemical Company, Inc. (chemical repackaging; known Aroclor 1248 detections in drain sediment)
   - Coronet Chemical (reclaimed naphthalene; developing a sodium dispersion to destroy PCBs; known Aroclor 1248 in drain sediment)
   - County Lift Truck Service, Inc. (forklifts)

- CWC Industries, Inc. (solvent coatings)
- Fleet Auto Electric Company, Inc. (repairs)
- Grignard Chemical Company, Inc. (petroleum and chemical products; known Aroclor 1248 in drain sediment)
- Essex Chemical Company (inorganic chemicals; See Essex Chemical Data Report)
- Honig Chemical and Processing Company
- Hummel Chemical (organic and pyrotechnical chemicals)
- Morrel Truck Service (repairs)
- Ohmlac Paint and Refinishing Company (roofing felts and coatings)
- RFE Industries
- Sequa Corporation (organic pigment manufacturing); See Sequa Data Report)
- Sun Chemicals (organic pigment manufacturing); See Sun Chemicals Data Report)
- Tennant Chemical Corporation
- Weston Chemical Corporation (PAS-00044629-630).

(PAS-00044654)

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (used, detected)

There is no information pertaining to use of COCs by Foundry Street Corporation; however, there is evidence of use and generation of COCs by tenants of the Foundry Street Complex owned by Foundry Street Corporation. See individual Data Reports for Ashland Chemical, Automatic Electroplating, Sequa Corporation, Sun Chemicals and Essex Chemical as examples.

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP[1].

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

5. COC Pathways

During a November 1990 site inspection at the Foundry Street Complex conducted by NJDEP, NJDEP observed a series of strip drains outside on both the northern and southern sides of Buildings 21 and 22. It is reported that the two strip drains appear to connect to another strip drain located along the western side of the facility. This strip drain, in turn, appears to be routed through the Foundry Street Complex and towards

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[1]*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Roanoke Avenue located to the north of the site (PAS-00105573; PAS-00105583; PAS-00114186).

It is reported that the Roanoke Avenue sewer connects to a sewer on Doremus Avenue, which flows to the Passaic Valley Sewerage Commission (PVSC) treatment works. There is a combined sewer overflow (CSO) outfall to the Passaic River at the foot of Roanoke Avenue (approximately River Mile 1.1). In 1969, the City of Newark constructed a dam near this CSO to increase flow to the Doremus Avenue sewer, and ultimately, the PVSC treatment works (PAS-00044625-PAS-00044626). It is reported that the Roanoke Avenue combined sewer system and outfall to the Passaic River was documented by PVSC to have been inoperative from 1971 through late 1979, and that discharges of hazardous substances into the sewer system of the Foundry Street Complex would have ultimately discharged directly to the Passaic River via the Roanoke Avenue CSO during periods when it was known to be in a chronic malfunctioning condition (PAS-00109572; PAS-00114295; PAS-00114311; PAS-00114320).

6. Regulatory History/ Enforcement Action

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

There is no information regarding permits in the available file material.

7. Response Actions

No information on response actions was documented in the available material.

8. Summary of Asserted Defenses

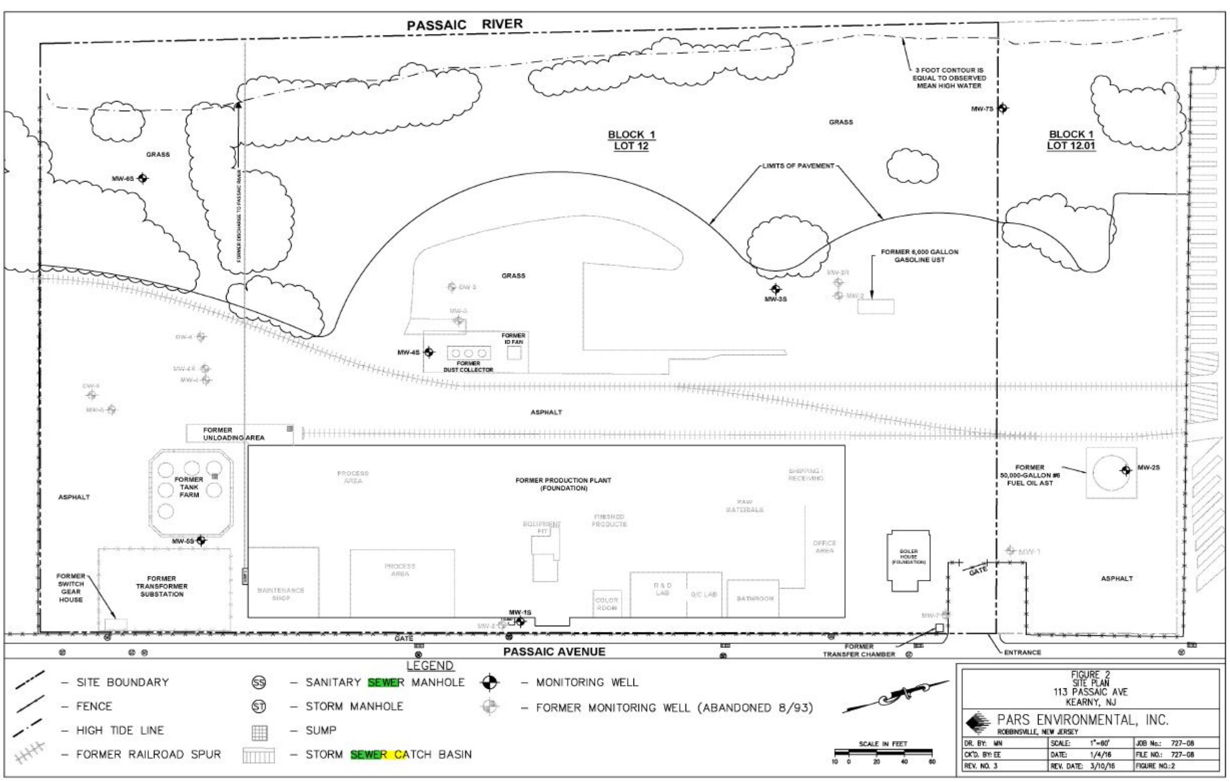
No legal defenses were identified in the available file material.

FRANKLIN-BURLINGTON PLASTICS, INC.

Facility Name, Address and Size: Franklin-Burlington Plastics, Inc., 113 Passaic Avenue, Kearny, New Jersey, Block 1, Lot 12 (PAP-00056120). Block 1, Lot 12 historically may have been known by other street addresses including 127 Passaic Avenue (PAP-00054083).

According to a New Jersey Department of Environmental Protection Preliminary Assessment Report, in 1976, when Franklin Plastics Corporation, which later became Franklin-Burlington Plastics, Inc., purchased Block 1, Lot 12, the facility occupied approximately 8.44 acres (PAP-00220430; PAP-00054646). In 1977, Franklin Plastics Corporation subdivided the parcel and sold 1.37 acres of the parcel (identified as Block 1, Lot 12.01 or 143 Passaic Avenue) to Kearny Holdings Corporation (PAP-00056121; PAP-00456789, 802-803). As part of the 1977 transaction, Franklin Plastics Corporation retained limited easement rights to access and use a 50,000-gallon No. 6 fuel oil above ground storage tank (AST) and the associated underground piping, railroad lines and a parking lot located under the eastern portion of Lot 12.01 (PAP-00056121; PAP-00456789-91, 800-801). Franklin Plastics Corporation did not own or have any rights to the remaining portion of Lot 12.01 after the 1977 sale (PAP-00456796; PAP-00056120-21). Franklin-Burlington Plastic's operations were conducted on the then 7.07 acre parcel known as 113 Passaic Avenue, Kearny, New Jersey (Block 1, Lot 12)(PAP-00056120).

In 1984, the Franklin-Burlington Plastics Facility employed an average of 70 people operating three shifts a day for five days a week (PAP-00054090). See site plan and property boundaries for Block 1, Lot 12 and Block 1 Lot 12.01 below.



(PAP-00056163)

Facility Data Report

1. **Business Type:** Compounder of polyvinyl chloride (PVC) cubes and pellets (PAP-00337323; PAP-00056122); manufacturer and prime supplier of vinyl compounds used for both injection molding and extrusion by its customers to manufacture finished products for automotive, aircraft, wire and cable, and shoe manufacturing industries, as well as extrusion processes (PAP-00057038; PAP-00054645).

2. **Time Period of Ownership/Operations**
   Operator: 1976 - 2010
   Owner: 1976 - 2017

1946: Congoleum Corporation, Floor Covering Division (also known as Congoleum-Nairn, Inc. and Congoleum Industries, Inc.), an entity unrelated to Franklin-Burlington Plastics, Inc., owned the property between 1946 and 1976 and conducted operations thereon from approximately 1946 to 1974 (PAP-00337307; PAP-00337323; PAP-00056120-21).

1950s: From the 1950s until approximately 1973 or 1974, Congoleum entities manufactured Asphalt Tile (AT) and (Vinyl Tile) in Building 115 on the property (PAP-00233590; PAP-00724244). Additional information concerning Congoleum entity ownership and operation of the Building 115 property is set forth in the *Congoleum Corporation Facility Data Report*.

1962: According to a February 1997 Response to an EPA Request for Information completed by Franklin-Burlington Plastics, Inc. (hereinafter the February 1997 Response), Franklin Plastics incorporated in April 1962 in the State of New Jersey (PAS-00063625).

1968: According to the February 1997 Response, Spartech Corporation (Spartech) incorporated in April 1968 in the State of Delaware (PAS-00063624) and was a plastics manufacturer (PAS-00063625).

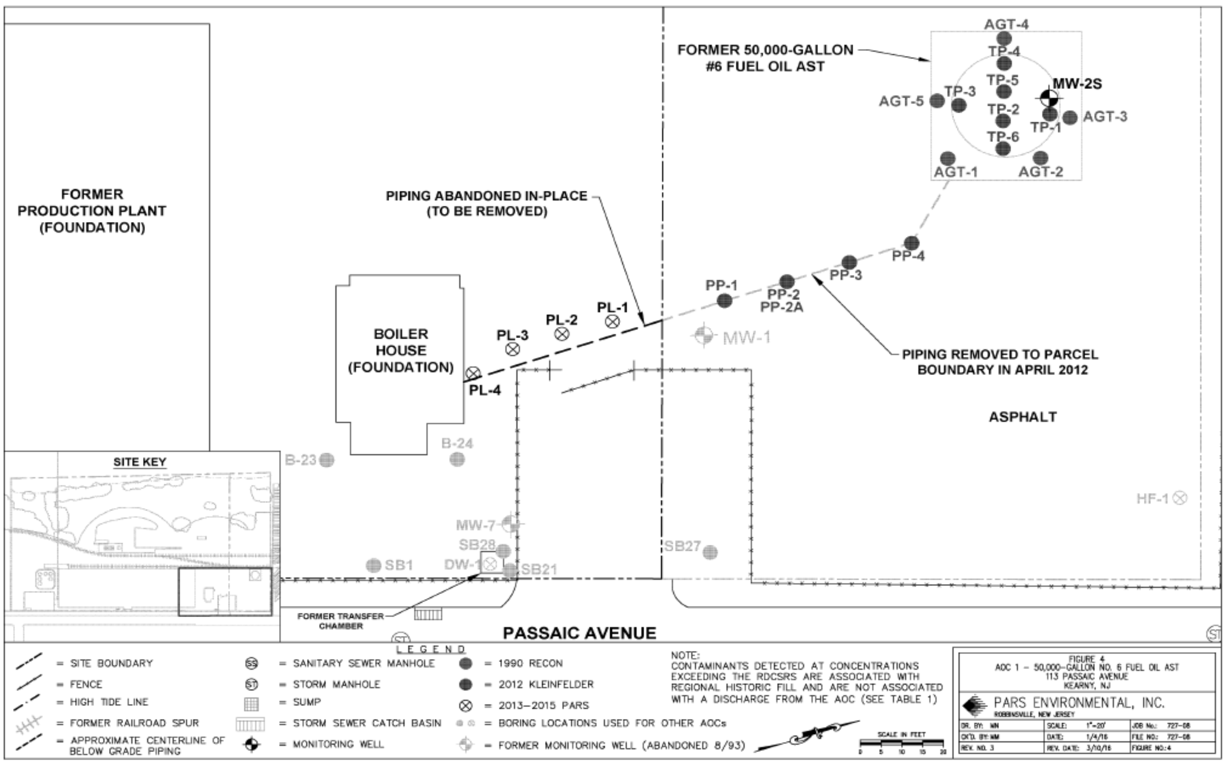
1976: On February 16, 1976, Congoleum Corporation conveyed to Franklin Plastics Corporation a parcel of land (Block 1, Lot 12) that was described through metes and bounds (PAP-00220430). The EDR Chain of Title Report indicates this to be Block 1, Lot 12 (PAP-00456810).

Franklin Plastics Corporation purchased an 8.44 acre parcel, which at the time was known as Block 1, Lot 12 on the Tax Map of the Township of Kearny, New Jersey (113 Passaic Avenue), from Congoleum Corporation and commenced plastics manufacturing compounding operations.

1977: According to a *Remedial Investigation Report, Volume 1 of 4*, dated March 2016, prepared by PARS Environmental, Inc., for Franklin-Burlington Plastics, Inc. (the 2016 PARS RIR), a 1.37-acre adjoining parcel classified as Block 1 Lot 12.01, 143 Passaic Avenue was used by Franklin Plastics. After purchasing an 8.44 acre parcel from Congoleum in 1976, the parcel was subdivided and a 1.37 acre parcel (Lot 12.01) was sold in 1977 to Kearny Holding Corporation. As part of the 1977 transaction, Franklin Plastics Corporation retained limited easement

rights to access and use a 50,000 gallon No. 6 fuel oil AST and the associated underground piping, railroad lines and a parking lot located on and under the eastern portion of Lot 12.01 (PAP-00056121; PAP-00456789-91, 800-801). Franklin Plastics Corporation did not own or have any rights to the remaining portion of Lot 12.01 after the 1977 sale (PAP-00456796; PAP-00056120-21). The AST, which supplied fuel oil to the boiler house, was removed in April 2012 by Kleinfelder East, Inc. (PAP-00056121).

See figure below for 50,000-gallon No. 6 fuel oil AST location.



(PAP-00056165)

1986: In February 1986 Franklin-Plastics entered into an Administrative Order of Consent (AOC) with the New Jersey Department of Environmental Protection (NJDEP) Division of Waste Management, which allowed Franklin Plastics Corporation to sell all outstanding shares of capital stock of Franklin Plastics Corporation prior to completing the standard Environment Clean-up Responsibility Act (ECRA) administrative process. (PAP-00337244-50). According to the 1994 *Final Report on Cleanup Plan Implementation and Finalization of ECRA/Industrial Site Recovery Act (ISRA) Responsibilities*, Franklin Plastics Corporation was sold to Spartech and became Spartech-Franklin Plastics (PAS-00063471, 73).

1987: Franklin-Burlington Plastics, Inc. incorporated on November 25, 1987 in the State of Delaware (PAS-00063626-32).

1989: On August 17, 1989, a Registration of a Fictitious/Alternate Name was filed with the New Jersey Secretary of State by Franklin-Burlington Plastics, Inc. The fictitious name was Spartech Polymers (PAP-00338665). Later that year, on November 6, 1989, a Registration of a Fictitious/Alternate Name was filed with the New Jersey Secretary of State by Franklin Plastics Corporation. The fictitious name was Spartech-Franklin Plastics (PAP-00338666).

1990: On April 23, 1990, a Certificate of Merger was filed with the State of Delaware merging Franklin Plastics Corporation into Franklin-Burlington Plastics, Inc., and continued plastics compounding operations (PAP-00338667-69; PAS-00063633-36).

On June 29, 1990, a Registration of a Fictitious/Alternate Name was filed with the New Jersey Secretary of State by Franklin-Burlington Plastics, Inc. The fictitious name was Spartech Franklin Plastics (PAP-00338670). On July 17, 1990, a memo was sent to announce that Spartech-Franklin was now known as Franklin-Burlington Plastics, Inc., doing business as (d/b/a) Spartech-Franklin effective July 1, 1990 (PAP-00338671).

1993: On May 5, 1993, Franklin-Burlington Plastics, Inc. filed a Registration of Alternate Name in New Jersey for a period of five years. The alternate name to be used was Spartech Franklin Plastics (PAP-00338679).

2010: On February 16, 2010, Franklin-Burlington Plastics ceased manufacturing operations at 113 Passaic Ave (PAP-00056563; PAP-00054628).

2014: All buildings were demolished in April 2014. The buildings stood vacant from February 2010 until they were demolished in 2014 (PAP-00056563; PAP-00056121).

2017: On May 22, 2017, 113 Passaic Avenue Urban Renewal, LLC acquired the site from Franklin-Burlington Plastics (PAP-00338807).

3. Operational History/COC Use and Presence at the Facility

According to the 2016 PARS RIR, in 1976, Franklin Plastics Corporation purchased the Property then known as 113 Passaic Avenue and began operations in the Production Plant located on the Property, which was identified by the former owner/operator, Congoleum, as Building 115 (PAP-00056121; PAS-00048607). The site contained the 55,000-square foot Production Plant and an 840-square foot boiler house. The Production Plant included a maintenance shop in the southeastern corner and an office area in the northeastern corner. Two laboratories (research and development and quality control) were located on the eastern side of the Production Plant. Site manufacturing operations ceased in 2010 and all buildings were razed in April 2014 (PAP-00056121).

Plastic Compounding Operations

According to the 2016 PARS RIR, from 1976 to 2010 plastic manufacturing at the site included the addition of various colorants, stabilizers, and plasticizers to vinyl resin to create pellets and cubes. The pellets and cubes were manufactured in a variety of colors and hardness based on recipe variations and client specifications (PAP-00056122; PAS-00048607).

Three production lines were utilized where fully polymerized PVC resin was blended with plasticizers and additives to produce PVC compounds. According to the 2016 PARS RIR, during the manufacturing process solid resin was automatically weighed and fed by augers and then transferred into either one of eight blenders or directly into a mixer (PAP-00056122). The March 1986 *Site Evaluation Submission* prepared by Franklin Plastics Corporation (the 1986 Franklin Plastics SES) noted production began with weigh feeding resin into either of two lorry cars that transferred the resins into one of six or eight blenders or a mixer (PAP-00057020).

According to both the 2016 PARS RIR and the 1986 Franklin Plastics SES, fillers pigments and stabilizers were manually added, and liquid plasticizers and other select oils were pumped into the blenders or directly to the mixer to complete the loading. A Kleisler designed dust collector was continually employed and a combined ventilation exhaust system captured and removed free dust from the surrounding atmosphere to outdoor bins (PAP-00056122; PAP-00057020-21).

According to the PARS 2016 RIR, after cycle completion, the blenders discharged the powdered mix to feeders into continuous mixers or extruders, which fluxed the dry powder to create a plastic material. The plastic material was then cut into pellets or cubes before being packaged and shipped to customers (PAP-00056122).

According to the 1986 Franklin Plastics SES, the blenders discharged the powdered mix via covered containers to Vibra feeders for metered feeding into continuous mixers (similar to Banbury mixers). The hot plastic mass was continuously extruded and conveyed to feed the nip of a 2-roll mill. The rolled ribbon went through a refrigerated water bath to cool until it was semi-rigid. The cooled ribbon continued into a dicer and shaker to produce pellets for storage in hoppers. The hoppers contained the pellets until they were bagged, boxed, and at times, pneumatically loaded onto railroad hopper cars. Other bagged or boxed pellets were transferred to warehousing pending shipping (PAP-00057021). There was no chemical manufacturing or processing conducted at the Facility other than mechanical mixing and blending (PAP-00057021).

Product Unloading Procedure

According to a 1986 Franklin Plastics SES, the majority of purchased PVC resin was delivered to the facility via railcar and/or container truck and transported into any of three silos above the roof. The resin came in 50-pound bags (at times), and the plasticizers were delivered and pumped into storage tanks (PAP-00057020).

According to the *Combined Spill Prevention, Control, and Countermeasure Plan and Discharge Prevention, Containment and Countermeasure Plan/Discharge Cleanup and Removal Plan for the Facility*, dated July 23, 2009 (2009 SPCC/DPCC/DCR Plan), a tanker truck unloading station for plasticizers is located in the southwest corner of the Production Plant. The tanker truck unloading area was a concrete spill containment area that extended below grade to provide secondary spill containment for the contents of the tanker truck should a spill occur (PAP-00055759). The plasticizers were transferred from the delivery trucks to individual ASTs located in the tank farm and within the Production Plant. The tank farm located on the southwest portion of the Facility contained six plasticizer storage tanks constructed of steel and coated with a corrosion resistant material. The tanks were located in an epoxy-sealed block wall containment area, which provided secondary spill containment for these tanks (PAP-00055751-52). Pigments and stabilizers were delivered via truck to the Production Plant's exterior, asphalt paved receiving area in boxes, bags, and fiber drums. The receiving area, located on the north side of the Production Plant, was sloped towards the Production Plant, covered with an overhang, and did not contain any storm drains (PAP-00055758).

No. 6 fuel oil, which was stored in a 50,000-gallon AST, was delivered to the Facility via tanker truck. Unloading was performed within a bermed area adjacent to the 50,000-gallon AST (PAP-00055754). The *Spill Prevention, Control and Countermeasure Plan,* dated February 5, 1992 (1992 SPCC Plan) states that the 50,000-gallon No. 6 fuel oil AST was located north of the Production Plant within a containment area comprised of a concrete pad with concrete block walls. After the Facility was converted to natural gas circa 1992, fuel oil was not delivered to this AST on a regular basis (PAP-00338487). The 2009 SPCC/DPCC/DCR Plan specifically notes this AST was taken out of service in accordance with applicable New Jersey regulations (PAP-00055751).

No. 2 fuel oil was occasionally delivered to the two 275-gallon ASTs located on an asphalt-paved surface on the northeastern portion of the Facility. These two ASTs were used as a backup fuel supply for the boiler house, so fuel was not delivered to these ASTs on a regular basis. The 2009 SPCC/DPCC/DCR Plan specifically notes that these ASTs were taken out of service in accordance with applicable New Jersey regulations (PAP-00055751).

Powdered PVC resins are not a regulated substance as defined by the EPA SPCC and NJDEP SPCC regulations, so there is no discussion of their delivery and unloading procedure in the 2009 SPCC/DPCC/DCR Plan (PAP-00055745). According to the PARS 2016 RIR, powdered PVC resins were delivered to the west side of the Production Plant in bulk by rail cars and tank trucks. The resins were pneumatically transferred from the rail cars into one of three silos located on the roof of the Production Plant (PAP-00056122).

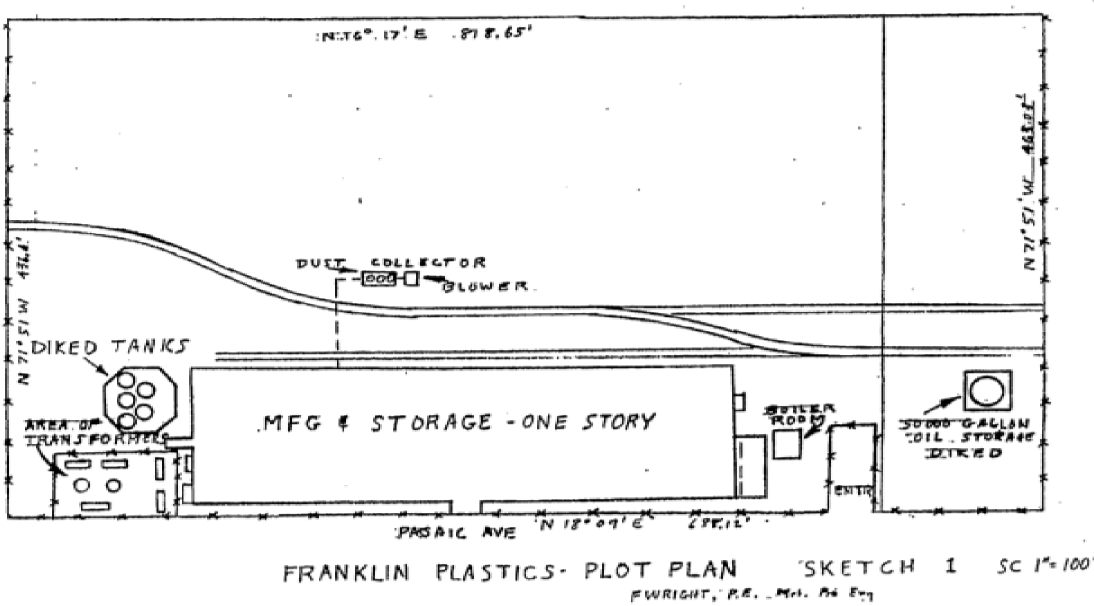
Product Waste Stream

According to the 1986 Franklin Plastics SES, there were three waste streams generated by plastic compounding at the facility:

- The mixer jacket and 2-roll mill were cooled by a closed, non-contact water cooling system. Overflows were discharged into the floor trench system to a sump located by the transformer substation at the southeast corner of the Production Plant. The sump flowed directly into the Passaic River through a nine-inch pipe via a permit (PAP-00057021). According to New Jersey Pollution Discharge and Elimination System (NJPDES) direct discharge permit No. NJ0002194, both contact and non-contact cooling water was discharged through an 8-inch outfall pipe from February 1976 through May 2004 (PAP-00057110; PAP-00057276; PAP-00057271; PAP-00056126).

- A Kleisler designed dust collector captured free dust that was "almost entirely" recycled back into the process (PAP-00057021). The dust collector located to the west of the Production Plant was continually employed and a combined ventilation exhaust system captured and removed free dust. The dust was collected in outdoor bins. Periodically the bins were emptied and the collected materials were reclaimed and recycled back into the process (PAP-00056122; PAP-00057021).

- Precipitate derived from electrostatic precipitators located on the roof was piped to a collection drum within the facility. The precipitate was largely recycled back into the process (PAP-00057021). See the following undated Plot Plan for the location of the dust collector and manufacturing building (also known as the Production Plant).



(PAP-00057048)

Raw Material

According to the 2016 PARS RIR, the approximate percentages of raw materials based on an air permit application from 1989 were 50% PVC resin, 30% plasticizers, 19% calcium carbonate filler, and 1% stabilizer and pigments (PAP-00056122). The approximate percentages of raw materials is the same in the air permit application from 1979 (PAP-00338652).

On August 17, 1990, Spartech-Franklin Plastics stated in an Industrial Waste Survey that the raw material used for their operations consisted of PVC Resin, (62% of material used in final product) and Phthalate Oils (30% of material used in final product). The unused material was internally recycled for future use (PAP-00338674). Spartech-Franklin also stated that 25 tons of PVC dry blend pellets and 25 tons of PVC pellets that it generated were classified as reusable material and were re-used in house (PAP-00338675).

According to the September 17, 1990 *Site Inspection Report*, prepared by NUS Corporation for the Environmental Protection Agency (the 1990 EPA SI), Franklin Plastics Corporation used phthalates such as bis(2-ethylhexyl) phthalate, butylbenzyl phthalate, di-n-butyl phthalate, and di-n-octyl phthalates as plasticizers in its manufacturing process (PAP-00337321).

An August 15, 2008 Spartech Polycom, Inc. letter to the EPA stated that the Facility was working to reduce the use of lead compounds. The Facility targeted lead compounds specifically through the reduction of non-product output (NPO) of lead compounds. Lead compounds were used as a PVC stabilizer in electrical insulators. Many of these applications were required in order for that the material to meet Underwriters Laboratory (UL) listing specifications related to electrical fire protection product properties. The Facility implemented efforts to reduce NPO in these applications of lead compounds. It was achieved through handling changes as well as product substitution (using barium and zinc compounds in place of lead compounds - a polybutylene terephthalate [PBT] - whenever the application or specifications did not require the addition of lead compounds to the product) (PAP-00338386-87).

Sumps

According to the 2016 PARS RIR, the plastics pelletizing process used cooling water. Contact cooling water from the dicer and pelletizer operations were released to trenches in the Production Plant floor and directed to the collection sump on the east side of the Production Plant (Sump No. 1) (PAP-00056126).

Non-contact cooling water consisting of water from the air compressor cooling jacket, lab mill and blender cooling water and cooling tower overflow was also directed to Sump 1 (PAP-00057133; PAP-00057203; PAP-00056126). Water in Sump 1 drained via a pipe to Sump 2, located at the south end of the Production Plant. Water was also discharged from the Production Plant's maintenance shop directly to Sump 2 (PAP-00056126).

Sump 2 contained two chambers. The water from Sump 1 and the maintenance shop entered the first, east side, chamber where water flowed across a baffle with a cutout weir that held back floating materials from entering the second, west side, chamber. The outlet from the second chamber was elevated and allowed solids to settle. Water from the second chamber of Sump 2 flowed through the 8-inch diameter outfall pipe into the Passaic River via a NJPDES Permit No. NJ002194 (PAP-00056126). The discharge from Sump 2 continued until prior to June 2004, when the discharge pipe was sealed. All water generated at the Facility at that time was redirected from Sump 1 to the Passaic Valley Sewerage Commission (PVSC) sanitary sewer system (PAP-00057271; PAP-00056126).

Facility Storage Area

A *Combined Spill Prevention, Control, and Countermeasure Plan and Discharge Prevention, Containment, and Countermeasures Plan/Discharge Cleanup and Removal Plan (Three-Year Plan Renewal)* prepared by Levine-Fricke (LFR) dated February 22, 2000 (the 2000 LFR Three-Year Plan Renewal) was submitted on behalf of Franklin-Burlington Plastics, Inc. (d/b/a Spartech Polycom). Additionally, a *Combined Spill Prevention, Control, and Countermeasure Plan and Discharge Prevention, Containment, and Countermeasures Plan/Discharge Cleanup and Removal Plan (Three-Year Plan Renewal)* prepared by LFR Levine-Fricke dated July 1, 2003 (the 2003 LFR Three-Year Plan Renewal) was submitted on behalf of Franklin- Burlington Plastics, Inc. (d/b/a Spartech Polycom). The plans incorporated the Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR) Plans required by the NJDEP and the Spill Prevention, Control, and Countermeasures (SPCC) Plan which is required by the EPA (PAP-00338541-637; PAP-00055157-294). The following is a brief description of the Facility storage areas as stated in the 2000 LFR Three-Year Plan Renewal and the 2003 LFR Three-Year Plan Renewal. It should be noted that SPCC plans were prepared for the site beginning in 1985 (PAP-00055011-28). The SPCC plan and DPCC/DCR plans were combined beginning in 1997 (PAP-00055072-115).

Outdoor Oil Storage Tanks

- The 2000 LFR Three-Year Plan Renewal states that a 50,000-gallon No. 6 fuel oil storage tank was located in a diked area. The storage tank was no longer in use and had been taken out of service. All associated piping has been disconnected and the contents of this tank were planned to be removed in the near future (PAP-00338551). In the 2003 LFR Three-Year Plan Renewal, the tank was listed as cleaned and its contents removed (PAP-00055167). The AST was removed in April 2012 (PAP-00337663).

- The 2000 LFR Three-Year Plan Renewal states that two 275-gallon No. 2 fuel tanks were located in an un-diked area. These fuel tanks had been disconnected and were located within a shed outside the eastern wall of the boiler room. These tanks were small enough and far enough from the Passaic River that a spill was not likely to pose an environmental threat. The tanks were located

below the Passaic Avenue elevation, so a spill would not pose a threat to the roadway (PAP-00338551).

- The 2000 LFR Three-Year Plan Renewal states that one 500-gallon waste oil storage tank is located outside within a brick wall containment area (5-feet high and 1-foot wide walls). The brick wall containment area has a capacity of approximately 100,000 gallons. The containment walls and floor were covered with concrete to prevent subsurface contamination. A valved drain extending out from the containment wall allowed for removal of any collected water inside the containment wall. Before removal, a sample of accumulated water was visually analyzed for contamination. If contaminated, the oil was removed from the water using absorbent pads, or the water was collected and properly disposed of (PAP-00338551-52).

- The 2003 LFR Three-Year Plan Renewal states that the block wall containment area was sealed with epoxy and repainted in September 2002. There is no mention of the valved drain beginning in the 2003 LFR Three-Year Plan Renewal. The 2003 LFR Three-Year Plan Renewal and subsequent plans state that a trained employee manually pumped accumulated water within the block wall containment area. Before removal, a sample of accumulated water was visually analyzed for contamination. If contaminated, the oil or hazardous material was removed from the water using absorbent pads, or the water was pumped into 55-gallon drums and properly disposed (PAP-00055167).

<u>Outdoor Hazardous Substance Storage Tanks</u>

- The 2000 LFR Three-Year Plan Renewal states that there were five hazardous substance storage tanks located outside the production area on the southwest portion of the Facility within a brick wall containment area (5-feet high and 1-foot wide walls). The floor inside the containment area was covered with concrete to prevent subsurface contamination. The brick wall containment area has the capacity of approximately 100,000 gallons. The combined storage capacity of the five tanks was approximately 72,500 gallons. A valved drain extending outside the containment area allowed for removal of any collected water inside the containment wall. Before removal, a sample of accumulated water was visually analyzed for contamination. If contaminated, the material was removed from the water using absorbent pads, or the water was collected and properly disposed of (PAP-00338552). It should be noted that this is the same brick wall (block wall) containment area as discussed above regarding the 500-gallon waste oil storage tank.

  The number of tanks located within this area changed depending on the time period. The 2003 LFR Three-Year Plan Renewal identified six plasticizer tanks in this area. The 2003 LFR Three-Year Plan Renewal also states that the block wall containment area (which was sealed with epoxy and repainted in September 2002) had a capacity to hold the largest tank volume plus six inches of rainwater. There is no mention of the valved drain beginning in the 2003 LFR Three-Year Plan Renewal. The 2003 LFR Three-Year Plan Renewal and subsequent plans

state that a trained employee manually pumped accumulated water within the block wall containment area. Before removal, a sample of accumulated water was visually analyzed for contamination. If contaminated, the oil or hazardous material was removed from the water using absorbent pads, or the water is pumped into 55-gallon drums and properly disposed (PAP-00055167-68).

Indoor Bulk Storage Tanks

- The 2000 LFR Three-Year Plan Renewal states that there are 13 plasticizer storage tanks located indoors throughout the Production Plant. These tanks were all located far enough away from outside doorways that a spill was unlikely to escape the Production Plant (PAP-00338553).

Raw Material Storage Area

- The 2000 LFR Three-Year Plan Renewal states that totes and drums of raw materials were stored outside and adjacent to the 100,000-gallon containment area. The property is relatively flat and a spill would not likely reach the storm drains, the river, or the street (PAP-00338554).

- The 2000 LFR Three-Year Plan Renewal states that fiber and metal drum storage was located inside the Production Plant. The indoor area is slightly pitched and because of its location a spill would not exit the Production Plant or enter a storm drain (PAP-00338553).

- The 2003 LFR Three-Year Plan Renewal states that the totes and drums of raw materials are stored inside the Production Plant within the shipping and receiving area. The materials are stored far enough away from any door entrances so that any spills would not likely exit the Production Plant (PAP-00055169).

Waste Oil Storage Area

- The 2000 LFR Three-Year Plan Renewal states that waste oil drums were stored outside near the 100,000-gallon containment area on the southwest portion of the Facility. These drums stored rags and speedy dry contaminated with used oils from minor spills and leaks that occur within the Production Plant. All wastes are stored in 55-gallon drums. The drums were stored for 90 days or less and were removed by a licensed waste handler. Since this waste was mostly solid material, spills from this area are not expected to reach the storm drains, the river, or the street (PAP-00338554).

Bulk Unloading Areas - Plasticizer Unloading Area

- The 2000 LFR Three-Year Plan Renewal states that plasticizers, D10P/J25 I and DINP were received in the outdoor tanks located outside of the Production Plant. The plasticizers were transferred from the delivery tank truck to the individual storage tanks at approximately 25 gallons per minute (gpm). Each tank had a level indicator which extended the full height of the tank and gave a clear liquid

level indication during filling of the tank. It was standard procedure for a Plant employee to be present at all times to observe the tank filling (PAP-00338554).

- The 2000 LFR Three-Year Plan Renewal states that the truck unloading station for plasticizers was located in the west corner of the Production Plant, near the Passaic River[1]. The unloading area was a bermed ramp that extended below grade to provide secondary containment for the contents of the truck. Any accumulated rainwater was usually left to evaporate; however, a manually operated 250 gpm pump was available to pump the rainwater into the adjacent diked area for Tanks 12 and 13 (the previously discussed 100,000-gallon brick wall containment area) (PAP-00338555; PAP-00338585).

Bulk Unloading Areas - Oil Unloading Area

- The loading area for the two disconnected 275-gallon No. 2 fuel tanks located outside the eastern wall of the boiler room was located on a gravel parking lot below the Passaic Avenue elevation (PAP-00338555).

Transformer Area

- The 2000 LFR Three-Year Plan Renewal states that there were five transformers and two oil-containing circuit breakers located outside, adjacent to the Production Plant and were completely enclosed by a chain-link fence. The total volume of oil contained within the five transformers and two circuit breakers was approximately 4,400 gallons (PAP-00338556). It should be noted that the Amended Stormwater Pollution Plan updated by Argus Regulatory Management, LLC on November 11, 2005 stated that the transformers were located outside on a concrete pad within a bermed area (PAP-00054786). The transformer substation was located within a wholly contained bermed and fenced area, approximately 375 feet east of the Passaic River (PAP-00056131; PAP-00056579).

- The transformer substation located on the Property was installed and used by the former owner of the Property, Congoleum Corporation (PAP-00725660-61; PAP-00725626; PAP-00725627; PAP-00725628-30). The transformer substation was utilized by Franklin-Burlington Plastics from 1976 until 2010. The substation was located within a wholly contained bermed area and contained by a chain-link fence (PAP-00056131). Polychlorinated biphenyl (PCBs) were a component of the dielectric mineral oil that was sealed within electrical equipment consisting of five pad-mounted transformers, two circuit breakers, and 17 brushings (PAP-00056565; PAP-00056163; PAP-00055954). The five transformers consisted of two Allis Chambers (K-14098 and K-14301), two Westinghouse (K-14463 and K-14306), and one Pittsburgh transformer (PAP-00338663-64; PAP-00056565).

[1] The description of the truck unloading station in the 2000 LFR Three-Year Plan Renewal is misleading. Figure 2 – Site Plan of the 2016 PARS RIR shows the location of the truck unloading area (denoted on the Figure as "FORMER UNLOADING AREA"). The location is approximately 285 feet east of the River (PAP-00056163).

- On October 7, 1987, RECON Systems Inc. (RECON) informed the Kearny Fire Department that the two Westinghouse transformers had levels of PCBs concentrations greater than 50 parts per million (ppm); K-14463 at 115 ppm and K-14306 at 80 ppm. The remaining three were below 50 ppm (PAP-00338663-64). One of the transformers was retrofitted in July 1996 by replacing the dielectric mineral oil to lower the PCB concentration of the transformer from 616 ppm to 18 ppm (PAP-00338683; PAP-00055088).

- The electrical equipment was removed from the Facility in August 2013 (PAP-00056565). Demolition of the concrete pads, supports, and switchgear house of the former substation was conducted in April 2014 (PAP-00056566). Further discussion on the decommissioning of the transformer substation is available in the "Remedial Activities" section below.

Process Areas

- The 2000 LFR Three-Year Plan Renewal states that Spartech Polycom's production processes consisted of three production lines in which polymer resins are blended with plasticizers to alter the physical properties of the polymer. The plasticizer was pumped from the storage tank to a process tank on the production line, from which it is fed to the blender. The process tanks were not contained but were indoors located sufficiently far away from the outside doorways, so that no material would be expected to escape the Production Plant to become a discharge in the event of a leak. Contact and non-contact cooling water were used in the process. Due to the design of the process, hazardous substances would not enter this cooling water even during a process upset (PAP-00338557).

Loading Dock Area

- The 2000 LFR Three-Year Plan Renewal states that the loading dock area was located on the east side of the Production Plant. Drums of raw materials were transferred in this area. The loading dock area did have an overhang to protect the area from rainwater (PAP-00338557).

- The 2003 LFR Three-Year Plan Renewal describes the location of the loading dock area as being on the North side of the Production Plant. The loading dock area was paved with bituminous macadam and sloped slightly back to the Production Plant in order to act as secondary containment. Since minimal amounts of drummed materials were unloaded in this area and no storm drains are present, spills would not likely reach a navigable waterway. This area was not located near the river and is below the elevation of Passaic Avenue (PAP-00055173)

Chemical Storage

The following table shows the types of chemicals, amount of chemicals stored, number of days being stored, and where the chemical was located at the Facility. The source of

the information contained in the table below was obtained from the NJDEP Community Right to Know form that was submitted by Franklin-Burlington Plastics. Date of document and document source can be found in the first column of the table.

Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
January 1 - December 31, 1989 (PAP-00338126)	Lead Phosphate (Solid)	1,001 - 10,000	365	Plant - Lead Section
January 1 - December 31, 1989 (PAP-00338126)	Lead Stearate (Solid)	101 - 1,000	365	Plant - Lead Section
January 1 - December 31, 1989 (PAP-00338126)	Lead Sulphate (Solid)	1,001 - 10,000	365	Plant - Lead Section
January 1 - December 31, 1989 (PAP-00338127)	Petroleum Oil (Liquid)	1,001 - 10,000	365	Plant, Machine Shop
January 1 - December 31, 1989 (PAP-00338128)	Fuel Oil	10,001 - 50,000	365	Yard
January 1 – December 31, 1991 (PAP-00338147)	Lead Phosphate (Solid in bag)	1,001 -10,000	365	Plant - Lead Section
January 1 – December 31, 1991 (PAP-00338147)	Lead Stearate (Solid in bag)	1,001 - 10,000	365	Plant - Lead Section
January 1 – December 31, 1991 (PAP-00338147)	Lead Sulphate (Solid in bag)	101 - 1,000	365	Plant - Lead Section
January 1 – December 31, 1991 (PAP-00338148)	Petroleum Oil (Liquid)	1,001 - 10,000	365	Plant, Machine Shop
January 1 – December 31, 1992 (PAP-00338152;	Lead Phthalate (Pure Solid in bag)	1,001 - 10,000	365	Plant - Lead Section
January 1 – December 31, 1992 (PAP-00338153)	Lead Stearate (Pure Solid in bag)	101 - 1,000	365	Plant - Lead Section
January 1 – December 31, 1992 (PAP-00338153)	Lead Sulphate (Pure Solid in bag)	1,001 - 10,000	365	Plant - Lead Section
January 1 – December 31, 1992 (PAP-00338154)	Petroleum Oil (Pure Liquid in Steel Drums)	1,001 – 10,000	365	Plant, Machine Shop
January 1 – December 31, 1993 (PAP-00054307)	Lead Phthalate (Pure Solid in Bag)	1,001 – 10,000	365	Plant – Lead Section
January 1 – December 31, 1993 (PAP-00054307)	Lead Stearate (Pure Solid in Bag)	101 – 1,000	365	Plant – Lead Section
January 1 – December 31, 1993 (PAP-00054308)	Lead Sulphate (Pure Solid in Bag)	1,001 – 10,000	365	Plant – Lead Section
January 1 –	Petroleum Oil (Pure Liquid in Steel Drum)	1,001 – 10,000	365	Plant – Machine Shop

Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
December 31, 1993 (PAP-00054308)				
January 1 – December 31, 1995 (PAP-00338169)	Lead Phthalate (Pure Solid in Bag)	1,001 – 10,000	365	Plant – Lead Section
January 1 – December 31, 1995 (PAP-00338169)	Lead Stearate (Pure Solid in bag)	101 - 1,000	365	Plant – Lead Section
January 1 – December 31, 1995 (PAP-00338169)	Lead Sulphate (Pure Solid in steel drum)	1,001 -10,000	365	Plant – Lead Section
January 1 – December 31, 1995 (PAP-00338170)	Lead Compounds (Solid Mixture in bag)	1,001 -10,000	365	Warehouse (Pigment Area)
January 1 - December 31, 1996 (PAP-00338192)	Lead Compounds (Solid Mixture in fiber drum)	101 - 1,000	365	Color Area
January 1 - December 31, 1996 (PAP-00338192)	Lead Compounds (Solid Mixture in bag)	1,001 -10,000	365	Color Area
January 1 - December 31, 1996 (PAP-00338192)	Lead Compounds (Solid Mixture in steel drum)	1,001 -10,000	365	Color Area
January 1 - December 31, 1996 (PAP-00338195)	Lead Compounds (Solid Mixture in box)	100,001 - 250,000	365	Warehouse
January 1 - December 31, 1996 (PAP-00338196)	Lead Compounds (Solid Mixture in bag)	100,001 - 250,000	365	Warehouse
January 1 - December 31, 1997 (PAP-00338204)	Lead Compounds (Solid Mixture in fiber drum)	101 - 1,000	365	Color Area
January 1 - December 31, 1997 (PAP-00338204)	Lead Compounds (Solid Mixture in bag)	1,001 -10,000	365	Color Area
January 1 - December 31, 1997 (PAP-00338204)	Lead Compounds (Solid Mixture in steel drum)	101 - 1,000	365	Color Area
January 1 - December 31, 1997 (PAP-00338207)	Lead Compounds (Solid Mixture in box)	10,001 - 50,000	365	Warehouse
January 1 - December 31, 1997 (PAP-00338208)	Lead Compounds (Solid Mixture in bag)	10,001 - 50,000	365	Warehouse
1998 (PAP-00338222)	Lead Compounds (Pure Solid in bag)	101 - 1,000	365	Color Area – Southeast area of facility
1998 (PAP-00338222)	Lead Compounds (Solid Mixture in fiber drum)	101 - 1,000	365	Warehouse – Northwest area of facility
1998 (PAP-00338223)	Lead Compounds (Solid Mixture in box)	1,001 - 10,000	365	Color Area – Southeast area of facility

Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
1998 (PAP-00338227)	PVC-Chloroethylene, Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
1998 (PAP-00338227)	PVC-Chloroethylene, Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail tracks at the west side of facility
1998 (PAP-00338228)	PVC-Chloroethylene Polymer (Pure Solid in bag)	50,001 – 100,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 1999 (PAP-00338290)	Lead Compounds (Solid Mixture in bag)	101 - 1,000	365	Color Area – Southeast area of facility
January 1 - December 31, 1999 (PAP-00338290)	Lead Compounds (Pure Solid in fiber drum)	101 - 1,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 1999 (PAP-00338290)	Lead Compounds (Solid Mixture in box)	1,001 -10,000	365	Color Area – Southeast area of facility
January 1 - December 31, 1999 (PAP-00338291)	PVC·Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
January 1 - December 31, 1999 (PAP-00338291)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	250,001 – 500,000	365	Rail tracks at west side of facility
January 1 - December 31, 1999 (PAP-00338291)	PVC·Chloroethylene Polymer (Pure Solid in bag)	50,001 – 100,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2000 (PAP-00338237)	Lead Compounds (Pure Solid in box)	10,001 - 50,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2000 (PAP-00338241)	Lead Compounds (Solid Mixture in fiber drum)	1,001 - 10,000	365	Color Area – Southeast area of facility
January 1 - December 31, 2000 (PAP-00338241)	Lead Compounds (Solid Mixture in bag)	101 - 1,000	365	Color Area – Southeast area of facility
January 1 - December 31, 2000 (PAP-00338242)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
January 1 - December 31, 2000 (PAP-00338242)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail Tracks at the West Side of Facility
January 1 - December 31, 2000 (PAP-00338243)	PVC-Chloroethylene Polymer (Pure Solid in bag)	50,001 - 100,000	365	Warehouse, Northeast Area of Facility
January 1 - December 31, 2001 (PAP-00338280)	Lead Compounds (Solid Mixture in bag)	1,001 - 10,000	365	Color Area – West side of facility
January 1 - December 31, 2001 (PAP-00338280)	Lead Compounds (Solid Mixture in bag)	101 - 1,000	365	Color Area – West side of facility
January 1 - December 31, 2001 (PAP-00338280)	Lead Compounds (Pure Solid in box)	101 - 1,000	365	Warehouse – Northwest area of facility

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Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
January 1 - December 31, 2001 (PAP-00338281)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos south end of roof
January 1 - December 31, 2001 (PAP-00338281)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail tracks at the west side of facility
January 1 - December 31, 2001 (PAP-00338281)	PVC-Chloroethylene Polymer (Pure Solid in bag)	1,001 – 10,000	365	Warehouse – Northeast area of facility
January 1 - December 31, 2002 (PAP-00054543)	Lead Compounds (Solid Mixture in bag)	1,001 – 10,000	365	Color Area West Side of Facility
January 1 - December 31, 2002 (PAP-00054543)	Lead Compounds (Solid Mixture in bag)	101 - 1,000	365	Color Area West Side of Facility
January 1 - December 31, 2002 (PAP-00054543)	Lead Compounds (Pure Solid in box)	101 - 1,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2002 (PAP-00054544)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail Tracks at the West Side of Facility
January 1 - December 31, 2002 (PAP-00054544)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on South End of Roof
January 1 - December 31, 2002 (PAP-00054544)	PVC-Chloroethylene Polymer (Pure Solid in Bag)	1,001 – 10,000	365	Warehouse – Northeast area of facility
January 1 - December 31, 2003 (PAP-00338330)	Lead Compounds (Solid Mixture in bag)	1,001 - 10,000	365	Color Area – East side of facility
January 1 - December 31, 2003 (PAP-00338330)	Lead Compounds (Solid Mixture in bag)	1,001 - 10,000	365	Sea box South end of facility
January 1 - December 31, 2003 (PAP-00338330)	Lead Compounds (Pure Solid in bag)	10,001 - 50,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2003 (PAP-00338331)	PVCChloroethylene Polymer (Pure Solid in Railcar)	250,001 - 500,000	365	Rail tracks at the west side of facility
January 1 - December 31, 2003 (PAP-00338331)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
January 1 - December 31, 2003 (PAP-00338331)	PVC-Chloroethylene Polymer (Pure Solid in bag)	1,001 - 10,000	365	Warehouse – Northeast area of facility
January 1 - December 31, 2004 (PAP-00338338)	Lead Compounds (Solid Mixture in bag)	1,001 - 10,000	365	Color Area – East side of facility
January 1 - December 31, 2004 (PAP-00338338)	Lead Compounds (Pure Solid in bag)	10,001 - 50,000	365	Warehouse – Northwest area of facility
January 1 - December 31, 2004 (PAP-00338339)	Lead Compounds (Solid Mixture in bag)	1,001 -10,000	365	Sea Box – South end of facility

Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
January 1 - December 31, 2004 (PAP-00338339)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	500,001 - 1,000,000	365	Rail tracks at the west side of facility
January 1 - December 31, 2004 (PAP-00338339)	PVC-Chloroethylene Polymer (Pure Solid in bag)	10,001 - 50,000	365	Warehouse – Northeast area of facility
January 1 - December 31, 2004 (PAP-00338339-40)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	250,001 - 500,000	365	Silos on south end of roof
January 1 - December 31, 2005 (PAP-00338345)	Lead Compounds (Solid Mixture in bag)	500 – 999	365	Color Area – East side of facility
January 1 - December 31, 2005 (PAP-00338345-46)	Lead Compounds (Pure Solid in bag)	1,000 - 9,999	365	Warehouse – Northwest area of facility
January 1 - December 31, 2005 (PAP-00338347)	Lead Compounds (Solid Mixture in bag)	100 - 499	365	Sea Box South end of facility
January 1 - December 31, 2005 (PAP-00338347)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 – 99,999	365	Rail tracks at the west side of facility
January 1 - December 31, 2005 (PAP-00338347)	PVC-Chloroethylene Polymer (Pure Solid in bag)	10,000 – 24,999	365	Warehouse – Northeast area of facility
January 1 - December 31, 2005 (PAP-00338347-48)	PVC·Chloroethylene Polymer (Pure Solid in Silo)	25,000 - 99,999	365	Silos on south end of roof
January 1 - December 31, 2006 (PAP-00338366)	Lead Compounds (Solid Mixture in bag)	500 - 999	365	Color Area – East side of facility
January 1 - December 31, 2006 (PAP-00338366-67)	Lead Compounds (Pure Solid in bag)	1,000 - 9,999	365	Warehouse – Northeast area of facility
January 1 - December 31, 2006 (PAP-00338368)	Lead Compounds (Solid Mixture in bag)	100 - 499	365	Sea Box – South end of facility
January 1 - December 31, 2006 (PAP-00338368)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 – 99,999	365	Rail tracks at the west side of facility
January 1 - December 31, 2006 (PAP-00338368-69)	PVC-Chloroethylene Polymer (Pure Solid in bag)	10,000 – 24,999	365	Warehouse – Northeast area of facility
January 1 - December 31, 2006 (PAP-00338370)	PVC·Chloroethylene Polymer (Pure Solid in Silo)	25,000 – 99,999	365	Silos on south end of roof
January 1 - December 31, 2007 (PAP-00054896)	Lead Compounds (Pure Solid in Bag)	1,000 – 9,999	365	Northwest Area of Warehouse
January 1 - December 31, 2007 (PAP-00054896)	Lead Compounds (Pure Solid in Bag)	1,000 – 9,999	365	Warehouse, Northwest Area of Facility
January 1 - December 31, 2007 (PAP-00054897)	Lead Compounds (Solid Mixture in Bag)	100 – 499	365	Sea Box South end of the Facility

Chemical Storage				
Year	**Chemical**	**Daily Average Range (pounds)**	**Days on site**	**Storage Location**
January 1 - December 31, 2007 (PAP-00054897)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	25,000 – 99,999	365	Silos on South End of Roof
January 1 - December 31, 2007 (PAP-00054897)	PVC-Chloroethylene Polymer (Pure Solid in Bag)	25,000 – 99,999	365	Silos on South End of Roof
January 1 - December 31, 2007 (PAP-00054898)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 – 99,999	365	Rail Tracks at the West Side of Facility
January 1 to December 31, 2008 (PAP-00338451-52)	Lead Compounds (Pure Solid in bag)	1,000 - 9,999	365	Northwest area of Warehouse
January 1 to December 31, 2008 (PAP-00338453)	Lead Compounds (Pure Solid in bag)	1,000 - 9,999	365	Warehouse Northwest Area of the Facility
January 1 to December 31, 2008 (PAP-00338453)	Lead Compounds (Solid Mixture in bag)	100 - 499	365	Warehouse Northwest Area of the Facility
January 1 to December 31, 2008 (PAP-00338453-54)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	25,000 - 99,999	365	Silos on south end of roof
January 1 to December 31, 2008 (PAP-00338455)	PVC·Chloroethylene Polymer (Pure Solid in bag)	25,000 - 99,999	365	Warehouse - Northeast area of facility
January 1 to December 31, 2008 (PAP-00338455)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 - 99,999	365	Rail tracks at the west side of facility
January 1 to December 31, 2009 (PAP-00338467)	Lead Compounds (Pure Solid in bag)	500 - 999	365	Northwest area of warehouse
January 1 to December 31, 2009 (PAP-00338469)	PVC-Chloroethylene Polymer (Pure Solid in Silo)	25,000 - 99,999	365	Silos on south end of roof
January 1 to December 31, 2009 (PAP-00338469)	PVC-Chloroethylene Polymer (Pure Solid in bag)	1,000 – 9,999	365	Warehouse - Northwest area of facility
January 1 to December 31, 2009 (PAP-00338469)	PVC-Chloroethylene Polymer (Pure Solid in Railcar)	25,000 - 99,999	365	Rail tracks at the west side of facility

4. Identified COCs

- PCBs (used, released, detected)
- PAHs (used, released, detected)
- Copper (used, released, detected)
- Lead (used, released, detected)
- Mercury (used, released, detected)

PCBs

On August 21, 1996, EPA was informed that the Westinghouse transformer K14306 (1995 Sample results that showed 616 ppm contamination) retrofill had been completed (PAP-00338683). After the retrofill, the PCB concentration in Westinghouse transformer K-14306 was 18 ppm (PAP-00055088). Upon success of the retrofill for transformer K14306, the spare transformer may be retro filled as well (PAP-00338683).

According to the 2017 *Former Transformer Substation Remedial Action Report, Volume 1 of 2*, prepared by PARS Environmental, Inc., for Franklin-Burlington Plastics (the 2017 PARS RAR) soil samples by PARS were taken between December 2013 and March 2015 within the former transformer substation. PARS installed 29 borings within the former substation and a soil sample was collected from each boring location at the ground surface or at 0.5 foot depth interval immediately below the gravel layer. PCBs were detected in the sample collected from No. TS-24 at a concentration of 2.05 mg/kg. Low concentrations of PCBs were detected in samples TS-8, TS-10, TS-15, and TS-15DUP (PAP-00056565). PCBs were not detected above the laboratory MDLs in the remaining samples.

In 2014, Dallas Industrial Services, Inc. demolished structures at the site that included the concrete pads, supports and the switchgear house for the former transformer substation. Prior to the demolition, PARS collected in-situ concrete samples as per the NJDEP Guidance for Characterization of Concrete and Clean Material Certification for Recycling. One concrete chip sample from the former transformer substation, No. C-3 had a PCB concentration of 0.044 mg/kg. PCBs were not detected above the laboratory MDL in the remaining samples(PAP-00056566).

PAHs

The sampling results from the 1984 Hart PSA identified 6,690 ug/kg pyrene, 5,100 ug/kg phenanthrene, and 5,740 ug/kg fluoranthene in sample No. TankSA (PAP-00057074).[2] All samples were collected from the tank area south of the Production Plant. The depth of the soil samples was not provided in the reviewed material. The location of the soil samples are shown in the 1984 Hart PSA map located in the Copper section. According to the 1987 RECON SAP Results report, the following results were found for PAHs. See the 1987 sample location map provided above in the Copper section.

RECON 1987 PAH Data Summary		
Analyte:	**High Range Result (mg/kg):**	**Sample/Depth:**
Acenaphthene	8.7	B31/3 3.5-4.0"
Acenaphthylene	1.5 J	B31/3 3.5-4.0"
Anthracene	26	B31/3 3.5-4.0"
Benzo[a]anthracene	39	B31/3 3.5-4.0"
Benzo[a]pyrene	36	B31/3 3.5-4.0"
Benzo[b]fluoranthene	47	B31/3 3.5-4.0"
Benzo[g,h,i]perylene	14	B31/3 3.5-4.0"
Benzo[k]fluoranthene	47	B31/3 3.5-4.0"
Chrysene	40	B31/3 3.5-4.0"
Dibenz(a,h)anthracene	5.0 J	B31/3 3.5-4.0"
Indeno[1,2,3-cd]pyrene	19	B31/3 3.5-4.0"
Naphthalene	4.2 J	B31/3 3.5-4.0"
Pyrene	91	B31/3 3.5-4.0"

ND = Compound not detected above laboratory method detection limit
J = Estimated concentration (PAP-00056319-20)

[2] The referenced sample results were originally taken as part of the 1984 Hart PSA. The 1984 Hart PSA is only available as an appendix to the 1986 Franklin Plastics SES. The 1986 Franklin Plastics SES does not include the lab data from the 1984 samples, so there is no way to verify the reported data is correct and/or to check whether there were any accidental transcription errors.

On June 5, 1990, soil samples collected by NUS Corporation as part of the 1990 EPA SI identified the following PAH concentrations:

- 1,500 ug/kg benzo(a)pyrene in soil sample No. NJEP-S8 (Dilution Factor of 1) collected near the Production Plant gate (PAP-00337330).

- 4,600 ug/kg phenanthrene was identified in soil sample No. NJEP-S8 and 1,300 ug/kg phenanthrene in soil sample No. NJEP-S9 (DUP) (PAP- 00337330). Both samples were collected near the Production Plant gate.

- An estimated concentration of 3,600 ug/kg benzo(b)fluoranthene (Dilution Factor of 1) was found in soil sample No. NJEP-S8 (PAP-00337330). The depth of the soil samples was not provided in the reviewed material.

NJEP SED1 was taken north of the tank farm and NJEP SED2 was collected from the facility's sump pit (PAP-00337317; PAP-00337372). NJEP SED3 and NJEP SED4 were taken from the two storm drains bordering the facility on Passaic Avenue (PAP-00337311). The following table shows the analytic results.

NUS Corporation June 1990 PAH Sediment Data Summary				
Sample ID -	NJEP-SED1	NJEP-SED2	NJEP-SED3[17]	NJEP-SED4
Dilution Factor -	1	13	7.2	7.2
Analyte:	**Results (ug/kg):**			
Acenaphthene	Not Detected	Not Detected	J	J
Acenaphthylene	Not Detected	Not Detected	J	Not Detected
Anthracene	Not Detected	J	3,900	J
Benzo[a]anthracene	J	J	5,000	J
Benzo[a]pyrene	J	J	7,500	J
Benzo[b]fluoranthene	J	16,000	9,500	4,000 EN
Benzo[g,h,i]perylene	J	J	3,600	J
Benzo[k]fluoranthene	Not Detected	Not Detected	8,300 E	Not Detected
Chrysene	J	17,000	13,000	3,500
Dibenz(a,h)anthracene	Not Detected	J	J	J
Fluoranthene	J	27,000	39,000	5,600
Fluorene	Not Detected	J	J	J
Indeno[1,2,3-cd]pyrene	J	J	4,000	J
2-Methylnaphthalene	Not Detected	Not Detected	J	J
Naphthalene	Not Detected	Not Detected	J	J
Phenanthrene	J	J	15,000	4,400
Pyrene	J	25,000	18,000	7,000

J = Estimated value, compound present below the Contract Required Quantitation Limit (CRQL) but above the Instrument Detection Limit (IDL)
E = estimated value
N = Presumptive evidence of the presence of the material
(PAP-00337327-28)

According to the 1990 EPA SI, no PAH compounds were identified in the surface water samples (No. NJEP-SW1 collected directly from the Facility's discharge pipe nor in samples No. NJEP-SW2 and No. NJEP-SW3 were collected from the sump pit) (PAP-00337327-28; PAP-00337317).

The 2016 PARS RIR showed the following results for PAHs for the below AOCs which had at least one PAH detection above the NJ RDCSRS:

- AOC 1 (50,000-gallon No. 6 Fuel Oil Aboveground Fuel Tank) had 0.85 mg/kg benzo(a)anthracene and 0.68 mg/kg benzo(b)fluoranthene in soil sample No. PL-1, collected on January 8, 2016 at a depth of 2.3 to 2.8 feet (PAP-00056183).

- AOC 5/7 - Unloading Area Tank Farm Soil ranged from non-detect to 52 mg/kg benzo(a)anthracene, 56 mg/kg benzo(a)pyrene, 69 mg/kg benzo(b)fluoranthene and 31 mg/kg indeno[1,2,3-cd]pyrene were found in soil sample No. TF-17 collected between 0.5 and 1.0 feet bgs from the southwestern outside corner of the Production Plant (PAP-00056192). In addition, 1.4 mg/kg dibenz(a,h)anthracene was noted in Tank Farm soil sample No. TF-12 collected between 0.5 and 1.0 foot bgs between the boundaries of the Production Plant and tank farm (PAP-00056189).

Copper

According to the *Preliminary Site Assessment* prepared by Fred C. Hart, Inc. dated September 1984 (1984 Hart PSA), four surface soil samples were collected for chemical analysis and subsurface soil samples for physical inspection and OVA analysis. One surface sample consisted of a composite of several samples in a spill and vegetative stress area near the air pollution control units, and the other three samples were collected inside the tank containment area (PAP-00057068). See the 1984 sample location map below.

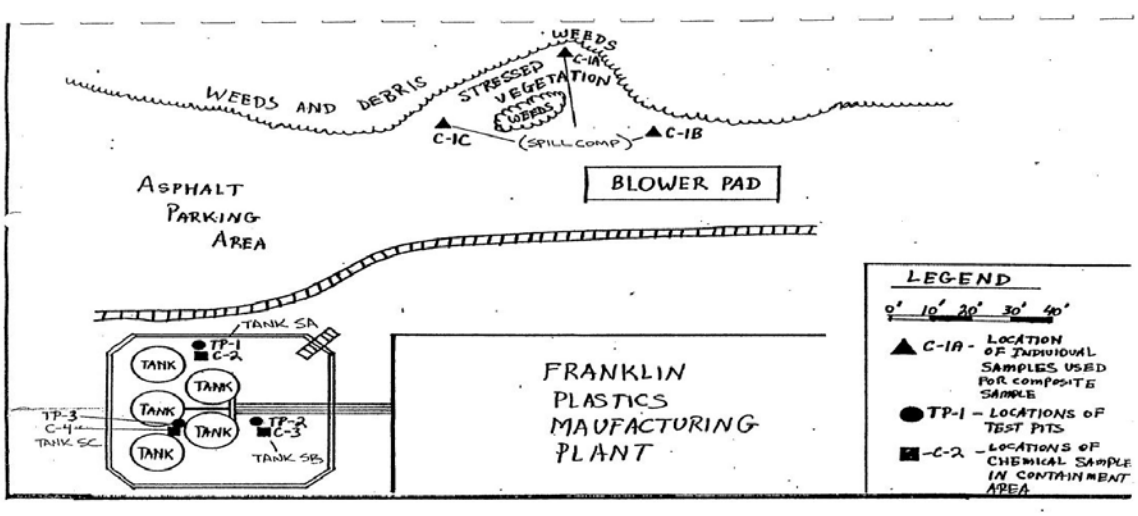


FIGURE 2. LOCATION OF SAMPLING SITES

(PAP-0057071).

The sampling results from the four samples collected on June 27, 1984 identified the following for copper:

- SPILLCOMP - 79,000 micrograms per kilogram (ug/kg)
- Sample Tank SA - 120,000 ug/kg
- Sample Tank SB - 290,000 ug/kg
- Sample Tank SC - 38,000 ug/kg (PAP-00057074)[3].

Note: The exact depth of the surface soil samples was not provided in the available file materials.

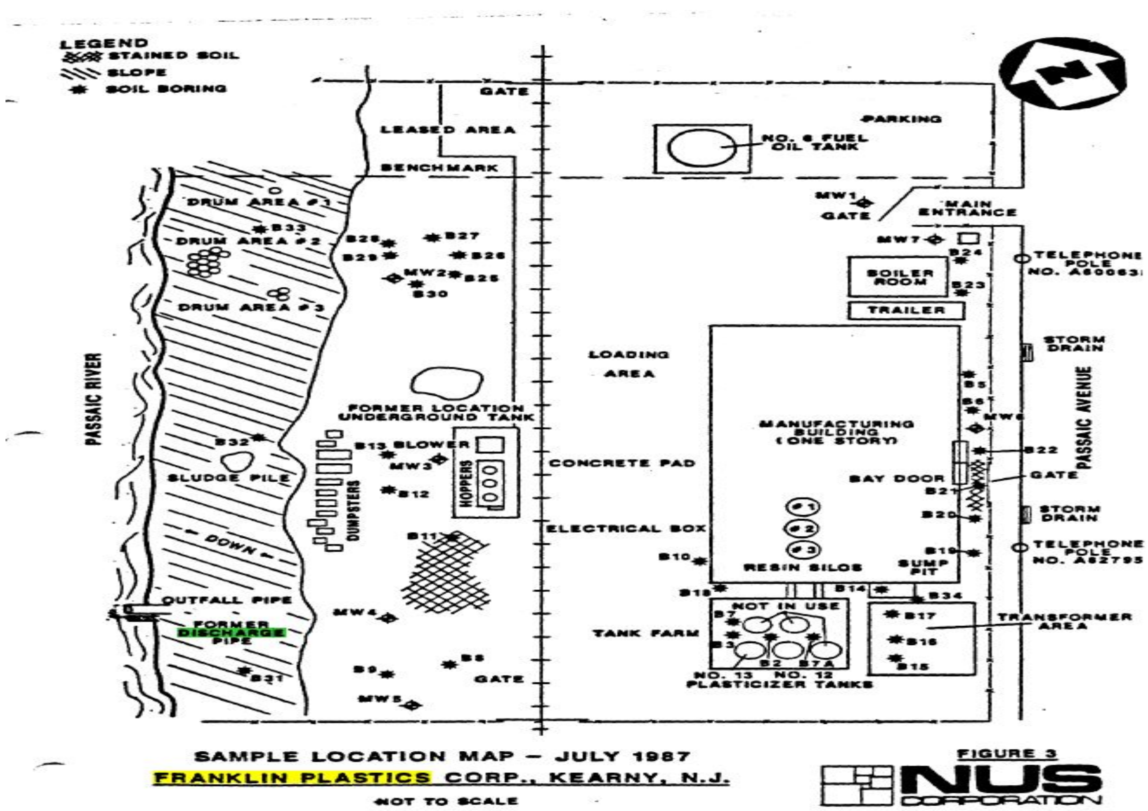
According to the *Sampling and Analyses Plan Results for Franklin Plastics Corporation* prepared by Recon Systems, Inc., dated October 1, 1987 (the 1987 RECON SAP) Results, Recon Systems, Inc. collected soil samples from 33 soil borings as part of the ECRA-required sampling. The following table shows location, depth and results for copper. See the following 1987 sample location map for locations.

RECON Soil Samples			
Location	**Sample**	**Depth (inches**	**Results**
Area 2- 275 gallon Aboveground Fuel Tanks	MW 1/1	0.5 – 1.0	37.6
Area 2- 275 gallon Aboveground Fuel Tanks	MW 1/2	3.5 – 4.0	212
Area 3- 6,000 Underground Gasoline Tank	MW 2/1	0.5 – 1.0	11.9
Area 3- 6,000 Underground Gasoline Tank	MW 2/2	3.5 – 4.0	11.7
Area 8- Dust Collector and Former Material Storage Area	MW 3/1	0.5 – 1.0	96.9
Area 8- Dust Collector and Former Material Storage Area	MW 3/2	2.5 – 3.0	20.9
Area 6- Expansion Chamber & Contaminated Soils	B 5/1	0.5 – 1.0	164
Area 6- Expansion Chamber & Contaminated Soils	B 5/2	2.8 – 3.3	64.6
Area 6- Expansion Chamber & Contaminate Soils	B 6/1	0.5 – 1.0	69.6
Area 6- Expansion Chamber & Contaminate Soils	B 6/2	3.3 – 3.9	31.5
Area 5- Plasticizer Tank Farm Area	B 7/1	0.5 – 1.0	40.2
Area 5- Plasticizer Tank Farm Area	B 7/2	3.6 – 4.1	232
Area 7- Loading/Unloading Area	B 8/1	0.5 – 1.0	123
Area 7- Loading/Unloading Area	B 8/2	1.1 – 1.7	89.7
Area 7- Loading/Unloading Area	B 9/1	0.5 – 1.0	12.9
Area 7- Loading/Unloading Area	B 9/2	3.3 – 3.9	31.8
Area 7- Loading/Unloading Area	B 10/1	0.5 – 1.0	291
Area 7- Loading/Unloading Area	B 10/2	2.5 – 3.0	29.9
Area 8- Dust Collector and Former Material Storage Area	B 11/1	0.5 – 1.0	60.2
Area 8- Dust Collector and Former Material Storage Area	B 11/2	2.7 – 3.2	21.7
Area 8- Dust Collector and Former Material Storage Area	B 12/1	0.5 – 1.0	53.0
Area 8- Dust Collector and Former Material Storage Area	B 12/2	2.1 – 2.7	32.1
Area 8- Dust Collector and Former Material Storage Area	B 13/1	0.5 – 1.0	34.0

[3] The referenced sample results were originally taken as part of the 1984 Hart PSA. The 1984 Hart PSA is only available as an appendix to the 1986 Franklin Plastics SES. The 1986 Franklin Plastics SES does not include the lab data from the 1984 samples, so there is no way to verify the reported data is correct and/or to check whether there were any accidental transcription errors.

RECON Soil Samples			
Location	**Sample**	**Depth (inches**	**Results**
Area 8- Dust Collector and Former Material Storage Area	B 13/2	1.6 – 2.1	24.1
Area 12- Random Sampling[4]	B 31/1	0.0 – 0.5	88.0
Area 12- Random Sampling	B 31/2	0.5 – 1.0	84.9
Area 12- Random Sampling	B 31/3	3.5 – 4.0	81.0
Area 12- Random Sampling	B 32/2	0.5 – 1.0	106
Area 12- Random Sampling	B 32/3	3.3 – 3.9	25.0
Area 12- Random Sampling	B 33/1	0.0 – 0.5	46.1
Area 12- Random Sampling	B 33/2	0.5 – 1.0	20.5
Area 12- Random Sampling	B 33/3	3.7 – 4.2	2070
Area 7- Loading/Unloading Area	MW 4/1	0.5 – 1.0	174
Area 7- Loading/Unloading Area	MW 4/2	3.5 – 4.0	136
Area 7- Loading/Unloading Area	MW 5/1	0.5 – 1.0	23.2
Area 7- Loading/Unloading Area	MW 5/2	3.5 – 4.0	717
Area 6- Expansion Chamber & Contaminated Soils	MW 6/1	0.5 – 1.0	75.8
Area 6- Expansion Chamber & Contaminated Soils	MW 6/2	6.3 – 6.9	136
Area 2- 275 gallon Aboveground Fuel Tanks	MW 7/1	0.5 – 1.0	124
Area 2- 275 gallon Aboveground Fuel Tanks	MW 7/2	3.6 – 4.1	210

(PAP-00337252-64; PAP-00056285-94; PAP-00056300-21)



(PAP-00337310)

[4] Random Sampling is clarified in the 1987 RECON SAP Results as soil samples collected at three borings (B-31, B-32 and B-33) in an area of urban fill between the Production Plant and the Passaic River (PAP-00337263).

On June 5, 1990, as part of the 1990 EPA SI, a total of 16 environmental samples were collected by NUS Corporation that included three surface water, four sediment, and nine surface soil samples. The copper concentrations were detected as follows:

NUS Corporation, June 1990, Copper Data			
Sample ID:	**Matrix:**	**Copper Result:**	**Units:**
NJEP-SW1	Surface Water	28.8	µg/L
NJEP-SW2	Surface Water	38.7	µg/L
NJEP-SW3	Surface Water	41.9	µg/L
NJEP-SED1	Sediment	327	mg/kg
NJEP-SED2	Sediment	3,200 E	mg/kg
NJEP-SED3[5]	Sediment	227	mg/kg
NJEP-SED4[6]	Sediment	103	mg/kg
NJEP-S1	Soil	162	mg/kg
NJEP-S2	Soil	23.5	mg/kg
NJEP-S3	Soil	81.8	mg/kg
NJEP-S4	Soil	21.8	mg/kg
NJEP-S5	Soil	23.4	mg/kg
NJEP-S6	Soil	112	mg/kg
NJEP-S7	Soil	103	mg/kg
NJEP-S8	Soil	56.3	mg/kg
NJEP-S9	Soil	54.4	mg/kg

E = estimated value
(PAP-00337311; PAP-00337332-22)

Lead

According to the 1984 Hart PSA, the sampling results from the four surface soil samples collected on June 27, 1984 identified the following for lead:

- SPILLCOMP - 6,900,000 ug/kg
- Sample Tank SA - 640,000 ug/kg
- Sample Tank SB - 1,100,000 ug/kg
- Sample Tank SC - 64,000 ug/kg (PAP-00057074).[7]

The depth of the soil samples was not provided in the available file materials. See the 1984 sample location map provided above in the Copper section.

In July 1987, Recon Systems, Inc. collected 33 samples from soil borings as part of ECRA-required sampling. See the 1987 sample location map provided above in the Copper section. The following table shows location, depth and results for lead.

[5] NJDEP-SED3 and NJDEP-SED4 were collected from two storm drains bordering the Facility on Passaic Avenue (PAP-00337311)
[6] NJDEP-SED3 and NJDEP-SED4 were collected from two storm drains bordering the Facility on Passaic Avenue (PAP-00337311)
[7] The referenced sample results were originally taken as part of the 1984 Hart PSA. The 1984 Hart PSA is only available as an appendix to the 1986 Franklin Plastics SES. The 1986 Franklin Plastics SES does not include the lab data from the 1984 samples, so there is no way to verify the reported data is correct and/or to check whether there were any accidental transcription errors.

RECON Soil Samples			
Location	**Sample**	**Depth (inches)**	**Results (mg/kg)**
Area 2- 275-gallon Aboveground Fuel Tanks	MW 1/1	0.5 – 1.0	229
Area 2- 275-gallon Aboveground Fuel Tanks	MW 1/2	3.5 – 4.0	179
Area 2- 275-gallon Aboveground Fuel Tanks	MW 2/1	0.5 – 1.0	51
Area 2- 275-gallon Aboveground Fuel Tanks	MW 2/2	3.5 – 4.0	69
Area 8- Dust Collector and Former Material Storage Area	MW 3/1	0.5 – 1.0	527
Area 8- Dust Collector and Former Material Storage Area	MW 3/2	2.5 – 3.0	68
Area 5- Plasticizer Tank Farm Area	B-2	Not specified	185
Area 5- Plasticizer Tank Farm Area	B-3	Not specified	83.4
Area 6- Expansion Chamber & Contaminated Soils	B 5/1	0.5 – 1.0	312
Area 6- Expansion Chamber & Contaminated Soils	B 5/2	2.8 – 3.3	739
Area 6- Expansion Chamber & Contaminated Soils	B 6/1	0.5 – 1.0	160
Area 6- Expansion Chamber & Contaminated Soils	B 6/2	3.3 – 3.9	48
Area 5- Plasticizer Tank Farm Area	B 7/1	0.5 – 1.0	67
Area 5- Plasticizer Tank Farm Area	B 7/2	3.6 – 4.1	1040
Area 7- Loading/Unloading Area	B 8/1	0.5 – 1.0	1740
Area 7- Loading/Unloading Area	B 8/2	1.1 – 1.7	523
Area 7- Loading/Unloading Area	B 9/1	0.5 – 1.0	31
Area 7- Loading/Unloading Area	B 9/2	3.3 – 3.9	126
Area 7- Loading/Unloading Area	B 10/1	0.5 – 1.0	283
Area 7- Loading/Unloading Area	B 10/2	2.5 – 3.0	2150
Area 8- Dust Collector and Former Material Storage Area	B 11/1	0.5 – 1.0	288
Area 8- Dust Collector and Former Material Storage Area	B 11/2	2.7 – 3.2	72
Area 8- Dust Collector and Former Material Storage Area	B 12/1	0.5 – 1.0	159
Area 8- Dust Collector and Former Material Storage Area	B 12/2	2.1 – 2.7	82
Area 8- Dust Collector and Former Material Storage Area	B 13/1	0.5 – 1.0	94
Area 8- Dust Collector and Former Material Storage Area	B 13/2	1.6 – 2.1	76
Area 12- Random Sampling[8]	B 31/1	0.0 – 0.5	360
Area 12- Random Sampling	B 31/2	0.5 – 1.0	265
Area 12- Random Sampling	B 31/3	3.5 – 4.0	225
Area 12- Random Sampling	B 32/2	0.5 – 1.0	229
Area 12- Random Sampling	B 32/3	3.3 – 3.9	123
Area 12- Random Sampling	B 33/1	0.0 – 0.5	161
Area 12- Random Sampling	B 33/2	0.5 – 1.0	44
Area 12- Random Sampling	B 33/3	3.7 – 4.2	802
Area 7- Loading/Unloading Area	MW 4/1	0.5 – 1.0	218
Area 7- Loading/Unloading Area	MW 4/2	3.5 – 4.0	217
Area 7- Loading/Unloading Area	MW 5/1	0.5 – 1.0	40
Area 7- Loading/Unloading Area	MW 5/2	3.5 – 4.0	436
Area 6- Expansion Chamber & Contaminated Soils	MW 6/1	0.5 – 1.0	302

[8] Area 12 Random Sampling is clarified in the 1987 Recon SAP Results as soil samples collected through three borings (B-31, B-32 and B-33) on an area of urban fill between the Production Plant and the Passaic River (PAP- 00337263).

RECON Soil Samples			
Location	**Sampl e**	**Depth (inches)**	**Results (mg/kg)**
Area 6- Expansion Chamber & Contaminated Soils	MW 6/2	6.3 – 6.9	1150
Area 2- 275-gallon Aboveground Fuel Tanks	MW 7/1	0.5 – 1.0	239
Area 2- 275-gallon Aboveground Fuel Tanks	MW 7/2	3.6 – 4.1	146

(PAP-00337252-64; PAP-00056285-94; PAP-00056300-21)

On June 5, 1990, samples collected by NUS Corporation identified the following highest lead concentrations:

- 818 mg/kg estimated value in sediment sample NJEP-SED2, collected from the facility's sump pit (PAP-00337311; PAP-00337332-33)[9]

- 2,520 mg/kg estimated value in soil sample NJEP-S6, collected near the sludge pile at a depth of 0 to 6" (PAP-00337311; PAP-00337332-33).[10]

The following table shows the results of the remaining samples collected by NUS in June 1990.

NUS Corporation, June 1990, Lead Data			
Sample ID:	**Matrix:**	**Lead Result:**	**Units:**
NJEP-SW1	Surface Water	3.4	µg/L
NJEP-SW2	Surface Water	4.4 E	µg/L
NJEP-SW3	Surface Water	10.7 E	µg/L
NJEP-SED1	Sediment	200	mg/kg
NJEP-SED3[11]	Sediment	596	mg/kg
NJEP-SED4[12]	Sediment	644 E	mg/kg
NJEP-S1	Soil	78	mg/kg
NJEP-S2	Soil	299	mg/kg
NJEP-S3	Soil	191	mg/kg
NJEP-S4	Soil	133	mg/kg
NJEP-S5	Soil	348	mg/kg
NJEP-S7	Soil	1,430 E	mg/kg
NJEP-S8	Soil	304	mg/kg
NJEP-S9	Soil	90.8	mg/kg

E = estimated value
(PAP-00337306; PAP-00337311; PAP-00337332-33)

According to the 2016 PARS RIR, the following soil sampling results exceeded the New Jersey Residential Direct Contact Soil Remediation Standards (RDCSRC) for lead of 400 mg/kg:

- AOC 5 – Plasticizer Tank Farm and AOC 7 – Unloading Area, 1,770 mg/kg lead was noted in Tank Farm soil sample No. TF-16 collected on October 30, 2014 between 2.0 and 2.5 feet below ground surface (bgs), south of the Former Tank

[9] The reported value in the 1990 EPA SI was 818 E. Per the notes from the sampling results chart, the "E" indicates that this was an estimated value.
[10] The reported value in the 1990 EPA SI was 2,520 E. Per the notes from the sampling results chart, the "E" indicates that this was an estimated value.
[11] NJDEP-SED3 and NJDEP-SED4 were collected from two storm drains bordering the Facility on Passaic Avenue (PAP-00337311).
[12] NJDEP-SED3 and NJDEP-SED4 were collected from two storm drains bordering Facility on Passaic Avenue (PAP-00337311).

Farm. 595 mg/kg lead was detected in Tank Farm soil sample No. TF-17, collected at 2.0 – 2.5 feet bgs (PAP-00056192).

- AOC 6 – Floor Drains, Trenches, and Piping, 2,220 mg/kg lead was noted in soil sample No. WL-01 collected on October 30, 2014, between 1.8 and 2.3 feet bgs in from within the trench system located in the foundation of the former Production Plant (PAP-00056212).

- Historical data contained in the 2016 PARS RIR showed that 3,100 mg/kg lead was found in March 2002 in soil sample No. SB2/B collected between 3.3 and 3.9 feet bgs a little north of the central gate (PAP-00056300).

As referenced in the 2016 PARS RIR, remaining structures at the site were demolished in April 2014. Prior to the demolition, PARS collected in-situ concrete and concrete block samples as per the NJDEP Guidance for Characterization of Concrete and Clean Material Certification for Recycling (PAP-00056148). The following concrete chip samples had concentrations of lead above the New Jersey RDCSRS of 400 mg/kg:

- 1,750 mg/kg lead was found in a concrete chip collected near the exit door from the Production Plant walls in sample No. C-21 C collected on March 14, 2014 (PAP-00056258).

- 623 mg/kg of lead was detected in the concrete chip sample collected from the Q/C lab Production Plant wall (PAP-00056256).

- 493 mg/kg of lead was detected in the concrete chip sample collected from the process area Production Plant concrete support (PAP-00056258).

Mercury

According to the 1984 Hart PSA, the sampling results from the four samples collected on June 27, 1984 showed the mercury concentrations for Sample Tank SA at 7,100 ug/kg and Sample Tank SB at 200 ug/kg. The other two results were detected below the method detection limit (MDL) (PAP-00057074, 76)[13]. The depth of the soil samples was not provided in the available file materials. See the 1984 sample location map provided above in the Copper section.

According to the 1987 RECON SAP Results, Recon Systems, Inc. collected soil samples from 33 borings as part of the ECRA-required sampling. The following table shows location, depth and results for mercury. See the 1987 sample location map for locations provided above in the Copper section.

[13] The referenced sample results were originally taken as part of the 1984 Hart PSA. The 1984 Hart PSA is only available as an appendix to the 1986 Franklin Plastics SES. The 1986 Franklin Plastics SES does not include the lab data from the 1984 samples, so there is no way to verify the reported data is correct and/or to check whether there were any accidental transcription errors.

RECON Soil Samples			
Location	**Sample Number**	**Depth (inches bgs)**	**Results (mg/kg)**
Area 2- 275 gallon Aboveground Fuel Tanks	MW 1/1	0.5 – 1.0	0.40
Area 2- 275 gallon Aboveground Fuel Tanks	MW 1/2	3.5 – 4.0	0.70
Area 2- 275 gallon Aboveground Fuel Tanks	MW 2/1	0.5 – 1.0	0.30
Area 2- 275 gallon Aboveground Fuel Tanks	MW 2/2	3.5 – 4.0	ND
Area 8- Dust Collector and Former Material Storage Area	MW 3/1	0.5 – 1.0	0.50
Area 8- Dust Collector and Former Material Storage Area	MW 3/2	2.5 – 3.0	ND
Area 5- Plasticizer Tank Farm Area	B-3	Not specified	ND
Area 6- Expansion Chamber & Contaminated Soils	B 5/1	0.5 – 1.0	0.70
Area 6- Expansion Chamber & Contaminated Soils	B 5/2	2.8 – 3.3	0.40
Area 6- Expansion Chamber & Contaminated Soils	B 6/1	0.5 – 1.0	0.40
Area 6- Expansion Chamber & Contaminated Soils	B 6/2	3.3 – 3.9	ND
Area 5- Plasticizer Tank Farm Area	B 7/1	0.5 – 1.0	ND
Area 5- Plasticizer Tank Farm Area	B 7/2	3.6 – 4.1	1.7
Area 5- Plasticizer Tank Farm Area	B 7/A	Not specified	0.10
Area 7- Loading/Unloading Area	B 8/1	0.5 – 1.0	0.10
Area 7- Loading/Unloading Area	B 8/2	1.1 – 1.7	0.40
Area 7- Loading/Unloading Area	B 9/1	0.5 – 1.0	ND
Area 7- Loading/Unloading Area	B 9/2	3.3 – 3.9	0.10
Area 7- Loading/Unloading Area	B 10/1	0.5 – 1.0	0.80
Area 7- Loading/Unloading Area	B 10/2	2.5 – 3.0	4.8
Area 8- Dust Collector and Former Material Storage Area	B 11/1	0.5 – 1.0	0.30
Area 8- Dust Collector and Former Material Storage Area	B 11/2	2.7 – 3.2	0.20
Area 8- Dust Collector and Former Material Storage Area	B 12/1	0.5 – 1.0	0.40
Area 8- Dust Collector and Former Material Storage Area	B 12/2	2.1 – 2.7	ND
Area 8- Dust Collector and Former Material Storage Area	B 13/1	0.5 – 1.0	ND
Area 8- Dust Collector and Former Material Storage Area	B 13/2	1.6 – 2.1	0.40
Area 12- Random Sampling[14]	B 31/1	0.0 – 0.5	0.60
Area 12- Random Sampling	B 31/2	0.5 – 1.0	0.30
Area 12- Random Sampling	B 31/3	3.5 – 4.0	0.60
Area 12- Random Sampling	B 32/2	0.5 – 1.0	1.4
Area 12- Random Sampling	B 32/3	3.3 – 3.9	0.30
Area 12- Random Sampling	B 33/1	0.0 – 0.5	0.20
Area 12- Random Sampling	B 33/2	0.5 – 1.0	ND
Area 12- Random Sampling	B 33/3	3.7 – 4.2	0.20
Area 7- Loading/Unloading Area	MW 4/1	0.5 – 1.0	0.30
Area 7- Loading/Unloading Area	MW 4/2	3.5 – 4.0	0.10

[14] Area 12- Random Sampling is clarified in the 1987 RECON SAP Results as soil samples collected at three borings (B-31, B-32 and B-33) in an area of urban fill between the Production Plant and the Passaic River (PAP-00337263).

RECON Soil Samples			
Location	**Sample Number**	**Depth (inches bgs)**	**Results (mg/kg)**
Area 7- Loading/Unloading Area	MW 5/1	0.5 – 1.0	0.10
Area 7- Loading/Unloading Area	MW 5/2	3.5 – 4.0	0.70
Area 6- Expansion Chamber & Contaminated Soils	MW 6/1	0.5 – 1.0	0.60
Area 6- Expansion Chamber & Contaminated Soils	MW 6/2	6.3 – 6.9	0.20
Area 2- 275 gallon Aboveground Fuel Tanks	MW 7/1	0.5 – 1.0	0.40
Area 2- 275 gallon Aboveground Fuel Tanks	MW 7/2	3.6 – 4.1	0.50

(PAP-00337252-64; PAP-00056285-94; PAP-00056300-21)

On June 5, 1990, samples collected by NUS Corporation identified the following highest mercury concentrations:

- 0.44 mg/kg in sediment sample NJEP-SED3, collected from an off-site storm drain located southeast of the Facility.
- 0.25 mg/kg estimated in soil sample NJEP-S-3, collected in Drum Area No. 3 at a depth of 0 to 6 inches (PAP-00337306, 311, 332-33)

The following table shows the mercury results of the remaining samples collected by NUS in June 1990.

NUS Corporation, June 1990, Mercury Data			
Sample ID:	**Matrix:**	**Mercury Result:**	**Units:**
NJEP-SW1	Surface Water	Not Detected[15]	µg/L
NJEP-SW2	Surface Water	Not Detected	µg/L
NJEP-SW3	Surface Water	Not Detected	µg/L
NJEP-SED1	Sediment	0.31	mg/kg
NJEP-SED2	Sediment	0.25 E	mg/kg
NJEP-SED4[16]	Sediment	0.33	mg/kg
NJEP-S1	Soil	0.17	mg/kg
NJEP-S2	Soil	0.16	mg/kg
NJEP-S4	Soil	0.1	mg/kg
NJEP-S5	Soil	0.2	mg/kg
NJEP-S6	Soil	0.12	mg/kg
NJEP-S7	Soil	Not Detected	mg/kg
NJEP-S8	Soil	0.16	mg/kg
NJEP-S9	Soil	0.11	mg/kg

E = estimated value
(PAP-00337311; PAP-00337332-33)

[15] According to the Notes of Table 4 of the 1990 EPA SI, a blank space indicated that the compound was analyzed for but not detected (PAP-00337332).
[16] NJDEP-SED4 was collected from a storm drain bordering the Facility on Passaic Avenue (PAP-00337311).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[17]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[18] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[19] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[20]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00056223-24).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	879 mg/kg
Mercury	168 mg/kg
Benzo(a)anthracene	8.8 mg/kg
Benzo(a)pyrene	9.1 mg/kg
Benzo(b)fluoranthene	5.3 mg/kg
Benzo(k)fluoranthene	6.2 mg/kg
Dibenzo(a,h)anthracene	2.8 mg/kg
Indeno(1,2,3-cd)pyrene	1.0 mg/kg

The Sampling and Analysis Plan Results Report - ECRA Case No. 86206 prepared by RECON Systems, Inc. dated October 1, 1987 (1987 RECON SAP Results) reported that the site is on the former flood plain of the Passaic River which forms the western property boundary. Substantial filling with urban refuse (excluding household waste) has taken place over the years. A substantial amount of urban fill has been placed in

[17] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).
[18] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[19] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[20] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

increasing depths as the Property gradually slopes westward toward the river (PAP-00337408).

According to the 2010 ISRA *Preliminary Assessment Report* (2010 ISRA PAR) prepared by Arcadis, the entire site contained nonindigenous fill material that was used to raise the elevation of the site. The material covered approximately 85% of the site and ranged in depth from between 5 and 7 feet deposited upon tidal marsh sediments. The western portion of the site along the Passaic River contained the most fill. A review of aerial photographs showed that the first stage of fill occurred between 1933 and 1946. The second stage occurred between 1953 and 1966. The fill was comprised of silty sand, course sand, cinders, gravel, brick fragments, rocks, wood pieces, glass, ceramics and scrap metal. Even with the fill events, the site was still subject to periodic flooding from the Passaic River (PAP-00054694).

According to a 1929 map prepared for Congoleum Nairn, Inc. depicting the land owned by Nairn Linoleum Co., bulkheading and fill operations on the Property began prior to 1929, when the Property was owned by “Watts Kearny” (PAP-00724491).

The 2016 PARS RIR confirmed the entire site was underlain by fill material (PAP-00056120). The 2016 PARS RIR subsurface investigation alleged that five to seven feet of fill material appeared to have been placed prior to development in 1946 PARS stated that additional fill material was placed along the riverbank circa 1966 (PAP-00056120). According to the 2016 PARS RIR, contaminants associated with Historic Fill included petroleum hydrocarbons, semi volatile organic compounds and metals that exceeded the RDCSRS. In the 2016 PARS RIR, PARS concluded that all contamination with the exception of extractable petroleum hydrocarbons (EPH) in the tank farm area, PCBs in the former transformer substation area, bis (2-ethylhexyl)phthalate (DEHP) and butyl benzyl phthalate (BBP) were related to Historic Fill (PAP-00056137). PARS Environmental, Inc. documented in the 2016 PARS RIR that remedial action was required to address Historic Fill. They recommended engineering controls for the entire site to cap soil impacts exceeding the RDCSRS and a deed notice (PAP-00056143).

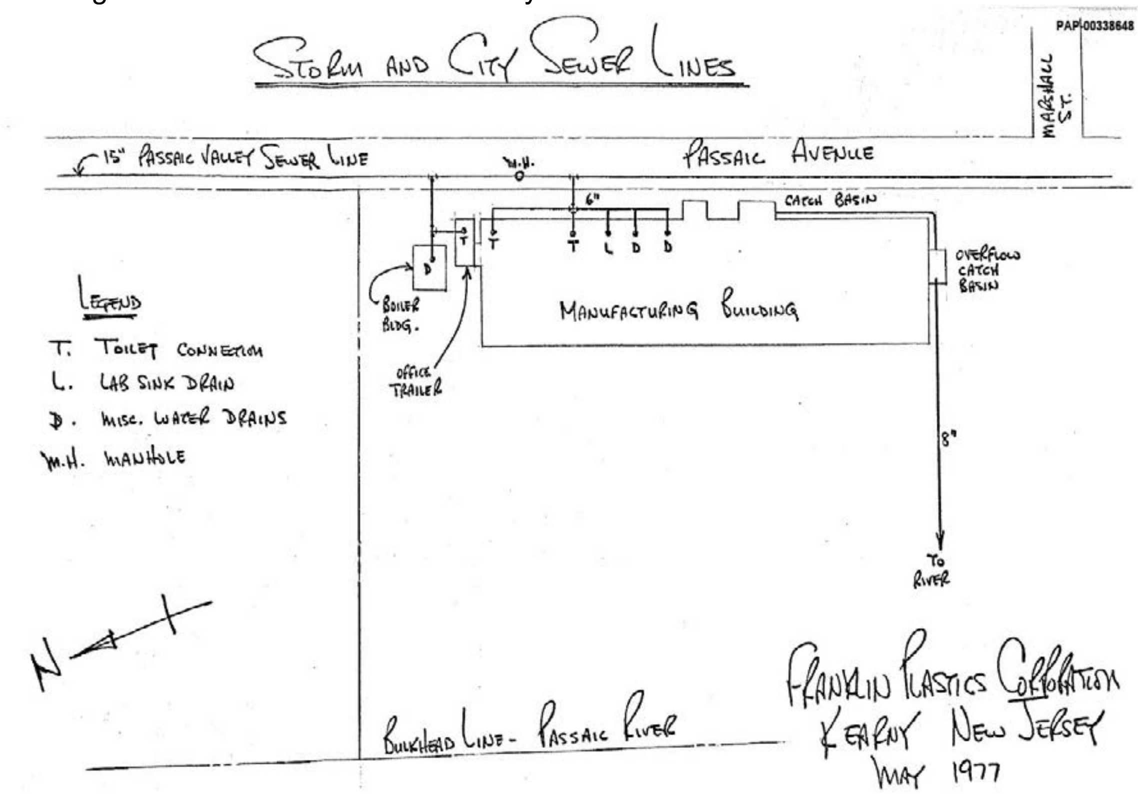
According to the 2017 PARS RAR, Historic Fill covers the majority of 113 Passaic Avenue and extends offsite to the north and south (PAP-00056563).

5. COC Pathways

Sanitary and Combined Sewer

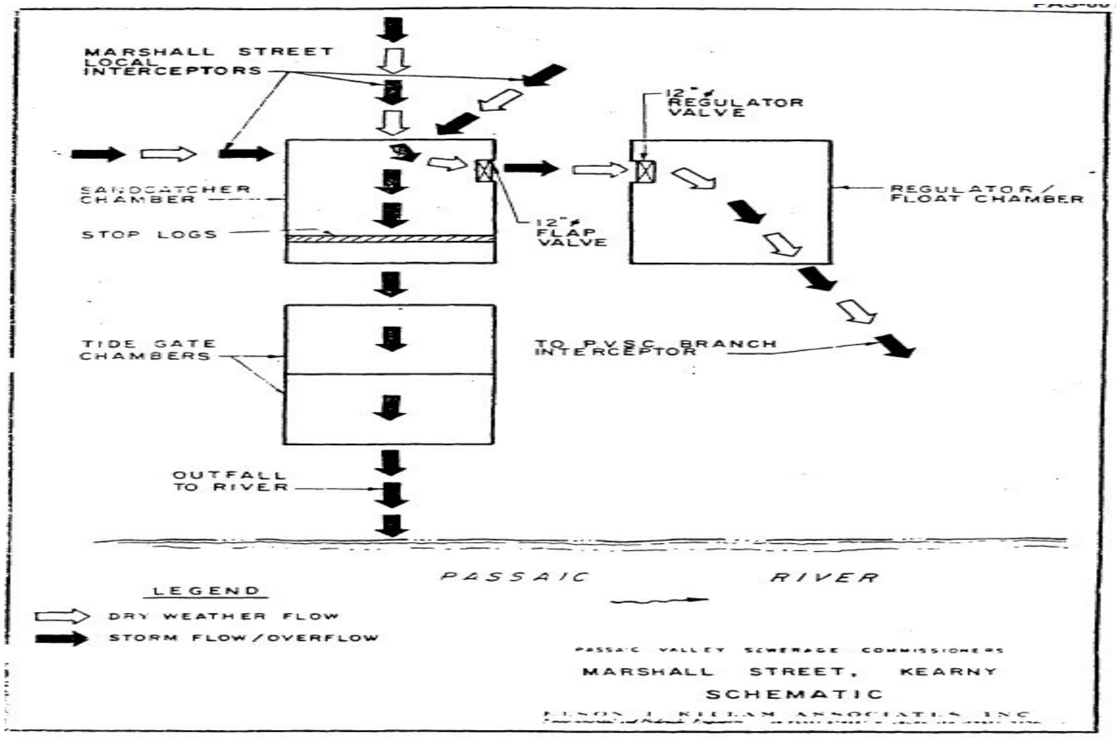
According to the 2016 PARS RIR, the Production Plant was connected to the municipal sanitary sewer system since its construction by the prior owner, Congoleum, in 1946 (PAP-00054650). The Facility was connected to the PVSC for the entire period of Franklin-Burlington Plastics’ operations from 1976 to 2010. Sanitary waste and water from the laboratory, boiler blowdown, and floor drains in the boiler house and laboratory area were discharged to the sanitary sewer system at all times during Franklin-Burlington’s operation of the Facility through two connections to a collection main along Passaic Avenue (PAP-00056128; PAP-00338648). One connection was for the boiler house. This connection carried boiler blowdown and water from a floor drain in the boiler

house. The other connection directed sanitary wastewater, water from the laboratory, and floor drains in the lavatory and laboratory areas to the PVSC (PAP-00338648). Contact and non-contact cooling water from the Facility was discharged to the PVSC from 2004 to 2010 (PAP-00057271). All buildings were razed in April 2014 (PAP-00056121). No discharges to PVSC occurred thereafter. See the 1977 drawing below showing the location of the storm and city sewer lines.

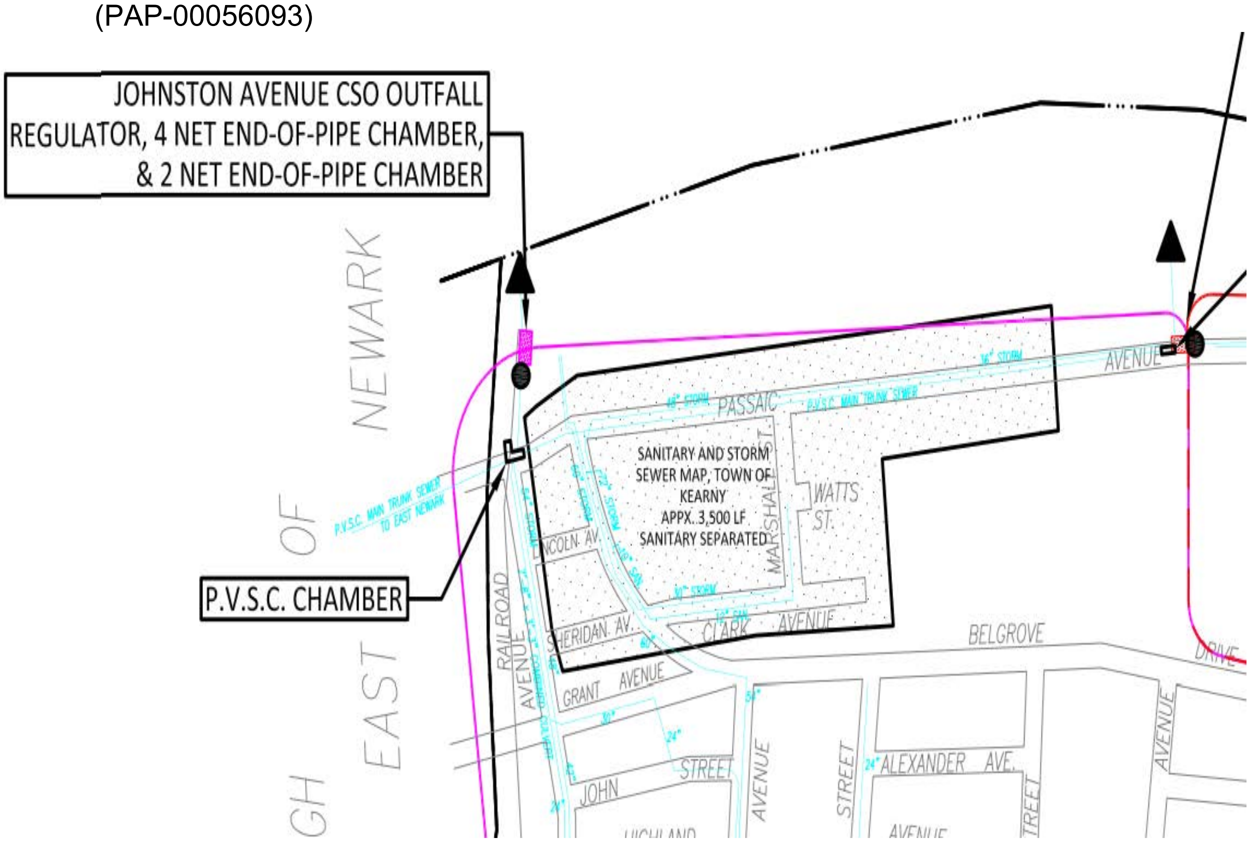


(PAP-00338648)

Flows in the Main Interceptor (Main Trunk Sewer) did not enter the Regulator. The Regulator's function was to divert flow into the Branch Interceptor. If the flow to the Regulator exceeded the capacity of the Regulator, the excess flow was diverted to the River as a combined sewer overflow (CSO). See Overflow Analysis Diagram below.



(PAP-00056093)



(PAP-00402441)

According to the 2014 Neglia Engineering CSO Map of Kearny above, the Marshall Street Regulator was located downstream (south) of Franklin's direct connections to the PVSC Main Interceptor. The Local Branch Interceptors connected to the Marshall Street Regulator were all on the east side of Passaic Avenue. The Franklin facility was on the west side and connected directly to the PVSC Main Interceptor (referenced as the PVSC Main Truck Sewer) through two direct connections. The flow from the Franklin facility entered the Main Interceptor pipe before the flow from the Marshall Street Regulator entered the PVSC Main Interceptor pipe (PAP-00402441).

The Marshall Street pump station was "sewer separated" sometime between May 27, 2005, where it was referenced in a Compliance Evaluation Report, and January 2014, where the sewer map prepared by Neglia Engineering Associates shows that wastewater from the Marshall Street collection area combined with and was transported to the Johnston Avenue pump station (PAP-00402441; PAP-00402441). After separation, the Marshall Street outfall is no longer a CSO.

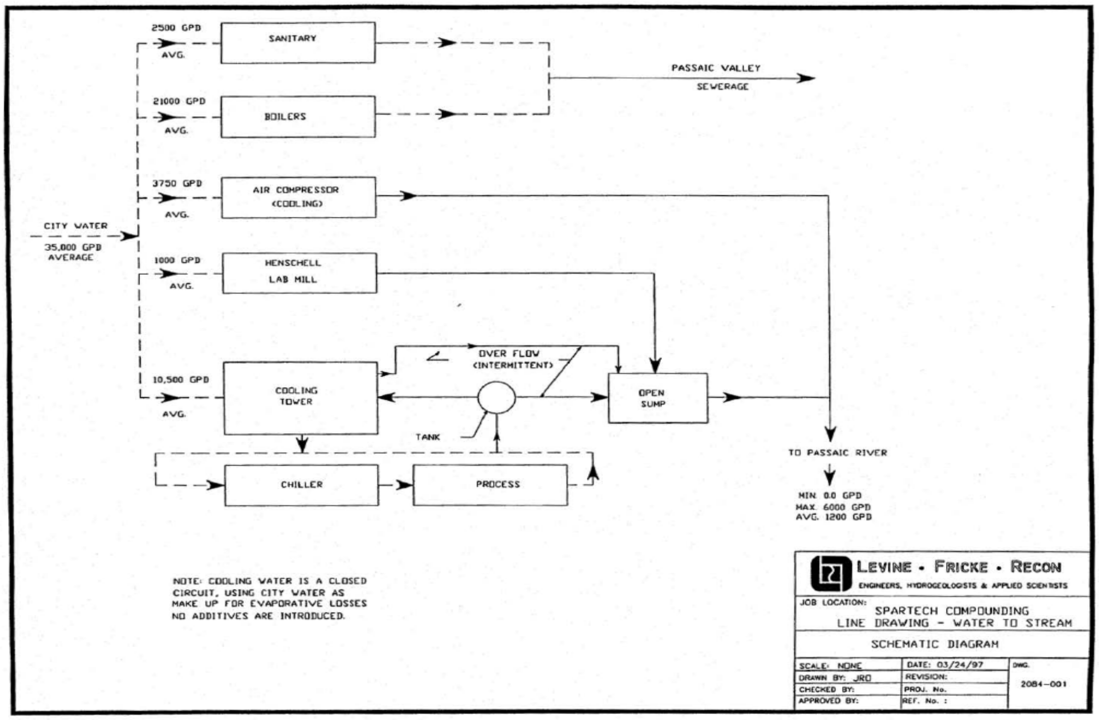
The Johnston Avenue CSO is located approximately 920 feet downstream from the Marshall Street Regulator and similarly collected combined wastewater and stormwater from Branch Interceptors and directed it into the PVSC Main Interceptor. The flow from the FBP Facility was already in the PVSC Main Interceptor at the point at which the flow diverted by the Johnston Avenue Regulator entered the PVSC Main Truck Sewer pipe (PAP-00402441).

Direct Release

Between 1976 and 2004, Franklin discharged water to the Passaic River via a NJPDES permit. The discharge water included both non-contact cooling water and contact cooling water from cooling baths (PAS-00048607). Non-contact cooling water was for a lab mill, air compressor cooling, and cooling tower overflow (PAP-00057133; PAP-00057203). According to the 2016 PARS RIR, the production plant at 113 Passaic contained floor drains and trenches that connected to two sumps (PAP-00056128). As discussed in more detail in the "Sumps" section above, Sump 2 flowed through the 8-inch diameter outfall pipe into the Passaic River via NJPDES Permit No. NJ002194 (PAP-00056126).

The 1990 EPA SI stated that overflow from the cooling tower, cooling water from the mixer jacket and roller mills, and drainage from indoor trenches was collected in the concrete-lined open sump pit along the south wall of the Production Plant (PAP-00337323).

See the following 1997 Schematic showing the flow of the water through the facility and to the Passaic River or Passaic Valley Sewerage.



(PAP-00057219)

According to the 2016 PARS RIR, in 2013 Production Plant trenches were cleaned and inspected by Arcadis. Significant cracks and deterioration were noted in the main trench in the central part of the Production Plant (PAP-00056128). PARS conducted an additional investigation of the drains and trenches in the Production Plant and found no OU2 COCs attributable to the former production activities at the site in the soil beneath the drains and trenches (PAP-00056128, 40).

On February 27, 2004, Spartech Polycom requested authorization for the discharge of non-contact and contact cooling waters to the sewerage collection systems serviced by PVSC. The proposed discharge consisted of an approximate maximum discharge of 11,000 gallons per day of non-contact cooling tower blowdown. The remainder of the Facility's discharge consisted of periodic discharges of approximately 2,000 gallons per week of pellet cooling water (PAP-00338803).

On September 16, 2004, Spartech Polycom sent a letter to NJDEP Division of Water Quality, Bureau of Point Source Management stating the facility had implemented wastewater re-use and conservation measures. The closed loop chiller was installed to replace the existing cooling tower thereby eliminating the facilities non-contact cooling water discharge to the Passaic River. The remaining small quantity of contact cooling water was discharged to the sanitary sewer as approved by PVSC. The discharge pipe utilized for the discharge of wastewaters to the Passaic River (under NJ0002194) was removed prior to June 1, 2004, from the river bank and the remaining underground portion capped securely at both ends (PAP-00338060).

On March 13, 2008, PVSC granted permission to discharge 100 gallons per day of mineralized cooling water blowdown that must be in compliance with all PVSC Rules and Regulations. The letter also notes that the Facility was authorized to discharge 2,000 gallons per week of contact pellet cooling water to the PVSC (PAP-00338804).

Flooding and Surface Water Runoff

Surface Water Runoff

A 1980 EPA *Potential Hazardous Waste Site Identification and Preliminary Assessment* form identified an open dump, landfill, drums, aboveground tanks, a railroad, and other major site activities. Overturned drums potentially contaminating the soil were noted onsite, as well as "many" 55-gallon drums that were leaking and overflowing.[21] The EPA staff member who prepared the form identified the apparent seriousness of the problems at the site as "low" (PAP-00337386-89).

As reported in the 1990 EPA SI, an onsite reconnaissance performed by NUS Corporation in April 1990 "noted a condenser blowdown drainage pathway between the southwest edge of the manufacturing building and the tank farm (PAP-00337303). The NUS Corporation also observed soil runoff from a stained soil area east of the Production Plant into two storm drains on Passaic Avenue (PAP-00337320-21). However, the Topographic Survey prepared by Dennis W. Sklar, Inc dated October 6, 2014 (the 2014 Topographic Survey) shows that these storm drains are topographically upgradient of the Facility (PAP-00056268).

The 2017 PARS RAR stated that storm water runoff from impermeable surfaces on the eastern portion of the Site flowed west toward the Passaic River. There were a few low lying areas on the central portion of the site where storm water may have accumulated. A drainage feature near the northwest corner of the Site (on Lot 12.01) collected storm water from paved areas at the site and from offsite run-on and drained into the Passaic River (PAP-00056563).

The 2009 SPCC/DPCC/DCR Plan states that stormwater runoff from the relatively flat site collected in a slight but broad general depression or basin on the West side of the property. Any spill would be contained in this basin and would not reach the Passaic River, which is adjacent to the Property. In addition, a vegetative buffer between this basin and the Passaic River served as a spill containment barrier between potential spill areas and the Passaic River (PAP-00055750).

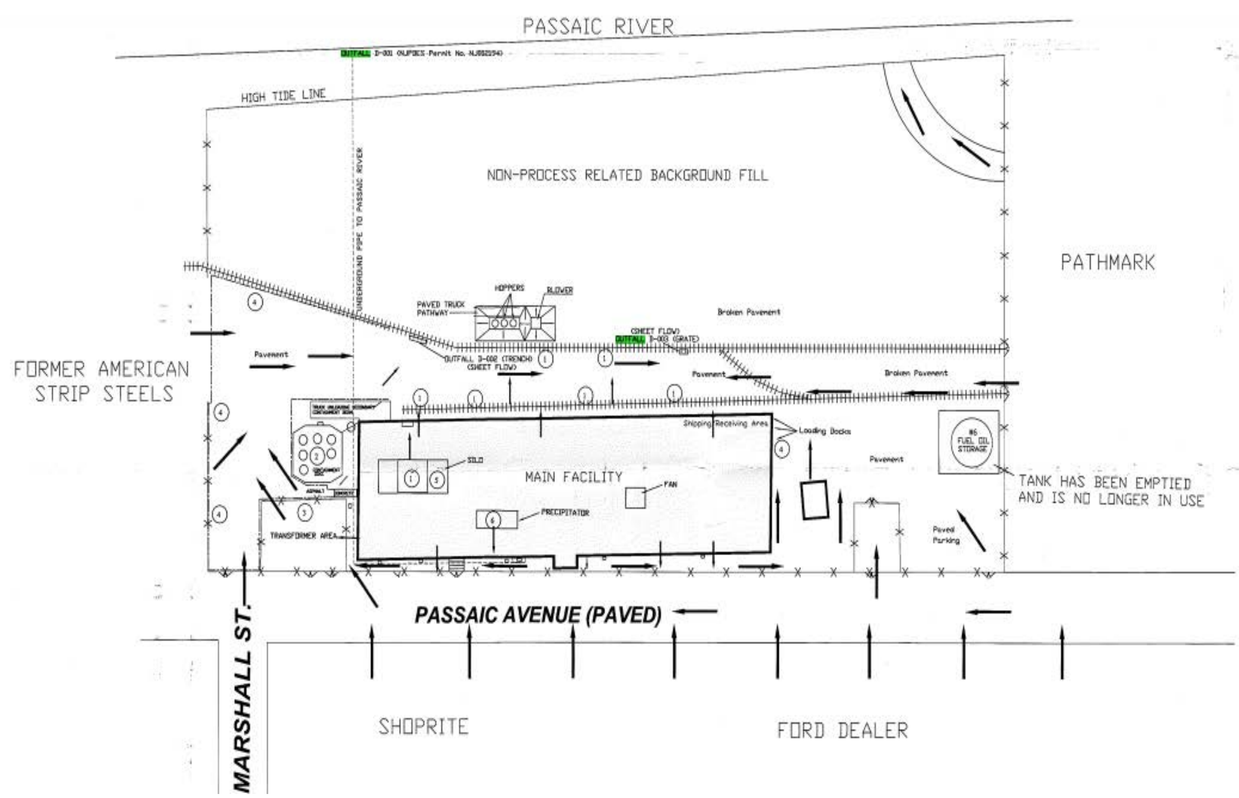
The 2009 SPCC/DPCC/DCR Plan also states that there were no storm sewers located on the Property (PAP-00055750). The Individual NJPDES Stormwater Discharge Permit issued by NJDEP on June 20, 2006 (the 2006 Individual Stormwater Permit) confirms that there were no storm drains, stormwater conveyance systems, or stormwater outfalls at the site. NJDEP further stated in the 2006 Individual Stormwater Permit that most of the Facility's stormwater was discharged to ground water (PAP-00056937). This is

[21] The Potential Hazardous Waste Site Identification and Preliminary Assessment form specifically notes that "The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections" (PAP-00337386).

consistent with the 2014 Topographic Survey which shows there were no major flow channels or ditches to direct stormwater across the 113 Passaic Avenue (PAP-00056268).

According to the *Amended Stormwater Pollution Prevention Plan* prepared by LFR dated October 10, 2002 (2002 Amended SPPP), stormwater flows entered the Franklin Burlington Plastics site from the neighboring properties. The 2002 Amended SPPP found that, based on conservative calculations, greater than three acres of the surrounding properties are located upgradient of the Facility. This drainage area corresponds to hundreds of thousands of gallons of stormwater for each inch of rainfall. A percentage of this drainage does enter the site during large rainfall events. The offsite drainage area that affect the Facility include two supermarket parking lots, an auto dealership, city streets, and abandoned manufacturing sites. Numerous contaminants originating from these offsite sources have the potential to negatively impact the site's stormwater quality (PAP-00056780). The significant water flow from the neighboring areas can be seen in the photos of the site taken during August of 2003 (PAP-00338070-78).

NJDEP stated in the 2006 Individual Stormwater Permit that the site is located on a low point of Passaic Ave., and "a large portion of offsite contaminated stormwater enters the property during periods of heavy rainfall." NJDEP further concluded that the Facility had no control over the event of receiving contaminated stormwater and that there was no reasonably available remedy (PAP-00056937). See the 2003 Surface Water Flow diagram below (PAP-00338638).



Site Flooding

According to the 1990 EPA SI, a portion of the property is occasionally flooded by high tides from the Passaic River. The Passaic River is located approximately 400 feet west of Franklin's Production Plant and forms the western border of the site (PAP-00337317). According to the 2016 PARS RIR, the site is periodically flooded by the Passaic River. Potentially contaminated sediments from the Passaic River are deposited onto the site during these flood events (PAP-00056133).

Spills

An August 1, 1984 Investigative Report for Franklin Plastics Corporation noted an oil-like substance that heavily contaminated the southwestern corner inside of the Production Plant. Two spills being cleaned by the workers were noted on the ground during the inspection in an area where a liquid plasticizer was discharged from tank trailers into pipes for storage (PAP-00338659).

The Sampling Analysis Plan (SAP) submitted as an appendix to the 1986 Initial Notice SES, focused on possible areas of spillage of the following:

- Phenols associated with asphalt storage in the tank farm at the souths side of the Facility during Congoleum Corporation ownership/operation of the Facility,

- Phthalates associated with unloading, storage, and processing of plasticizer compounds at transfer lines, around the dust collector system blower, and around the two storage tanks used for plasticizer storage,

- Heavy metal bearing pigments on and around process equipment within the Production Plant and the dust collector system blower,

- Transformer fluids associated with the transformer substation on the south side of the property,

- Petroleum hydrocarbons associated with oil lubricated compressor discharges throughout the Facility, and

- Gasoline from the underground storage tank or related plumbing system (PAP-00057055).

A NUS Corp. Region 2 FIT on-site reconnaissance of April 30, 1990 observed a stained soil area east of the manufacturing building (PAS-00063677). Surface soil samples were collected by NUS Corp. Region 2 FIT on June 5, 1990 from the stained soil area, from a run-off pathway outside the fence, and from two storm drains on Passaic Ave. The samples results were for constituents not related to this allocation (PAS-00063677).

6. Regulatory History/Enforcement Actions

Inspections

On January 7, 1980 NJDEP conducted a site visit for the Franklin Plastics facility. As a follow-up, EPA performed a Preliminary Assessment of Franklin Plastics on June 16, 1980. (PAP-00338653-56). Some overturned drums were identified as a potential hazard to the soil onsite, and "many" 55-gallon drums, both waiting for removal and stored for use, that were leaking and overflowing were identified as a potential hazard (PAP-00338653). On August 6, 1980, a Tentative Disposition, completed by the same government official who performed the Preliminary Assessment, determined that no further action was needed by EPA and recommended that there was no hazard (PAP-00338657).

According to the *Site Inspection Prioritization Evaluation*, dated September 29, 1995, in June 1984 a Preliminary Site Assessment (the 1984 PSA) was conducted by Hart Associates. As part of the 1984 PSA, Hart associates collected four soil samples. Sampling results showed plasticizers (phthalates), copper, lead, and mercury, along with other priority pollutant metals. The quality assurance/quality control (QA/QC) used for these samples was unknown (PAP-00054202).

On July 23, 1984, according to a memorandum dated August 16, 1984, the Bureau of Industrial Site Evaluation conducted a Preliminary ECRA Inspection and found that a waste paper basket fire in an office that occurred prior to the inspection had left "quite a few hundred gallons of water in the plant area." There were numerous violations that included spillage, discolored soils, oil saturated soils, improperly labeled drums, unmarked drums, disposal of drums, and other storage of material concerns. The inspector found thirty-three (33) 55-gallon drums in the parking lot that the plant manager, Joseph Ronzo stated was "rain water". Upon puncturing one of the drums, brownish, green liquid ran onto the ground and Joseph Ronzo stated "See, its"rainwater. Hundreds of unmarked sample bottles were noted in the Quality Assurance/Control Product Laboratory and were not mentioned in ECRA SES. The company was instructed to include documentation of wastes stored and disposed of from the Laboratory (PAP-00337237).

On August 1, 1984, the Division of Waste Management, Bureau of Field Operations conducted an inspection of the Facility for the purpose of checking on company storage practice of chemicals as stated in incident report No. 84-07-24-0IN. The following observations were made:

- On the area east of a boiler room there were four drums of No. 2 fuel oil and four drums of kerosene palletized and sitting on the ground. The inspector was informed by the Plant Manager that those drums would be transferred into the building (the Production Plant).
- On the yard by the south-western corner of the Production Plant, there was a large area of about 150-200 sq. yards, heavily contaminated with an oil-like substance. The area where the oil-like substance was observed corresponds to

the area where a liquid plasticizer was discharged from the tank trailers into the pipes for storage. The spill occurred when hoses were connected and some oils dripped from the tractors onto the asphalt paved surface.

- On the eastern side of the Production Plant and on the electric transformers area it was observed that the ground was heavily contaminated with and oil-like substance. The Franklin Plastics representative stated that the spots of contaminated ground by the Production Plant wall came from the steam releasing pipes, but there was no explanation regarding the transformer area.

- Some 40-50 steel, 35-gallon empty blue drums were noted to be stored on the southern area of the facility. The drums were palletized, stacked three high. The inspector was informed by the Plant Manager that the empty drums would be removed as soon as a scrap metal dealer willing to take them was located.

It was recommended that Franklin Plastics clean up all contaminated areas and to dispose of the clean out material properly (PAP-00338658-59).

According to the August 16, 1984 Preliminary ECRA Inspection memo, the Spill Prevention, Containment and Control (SPCC) Plan was never implemented and additionally, two gasoline underground storage tanks were not mentioned in the ECRA SES (PAP-00337238). Also reported was a large transformer substation containing PCB dielectric oil located at the Facility. The substation was located on an earthen surface, and no berms were present around the substation (PAP-00337238).

On December 20, 1984, a follow-up inspection of Franklin Plastics facility was conducted. The inspector found the premises clean and in good order except for minor spills of a white powder along the railroad tracks and minor spills of oil in the truck unloading area. The Franklin Plastics representative identified the white powder as resin used in the manufacturing process. The Franklin Plastics representative stated that the types of spills observed occur during working hours and are cleaned up each working day. The transformer area was observed to be free of any leaks or spillages and appeared to have new crushed stone in the area. The empty 35-gallon drums observed during the inspection on August 1, 1984 were gone and records showed that they were disposed properly. The inspector observed some oily spills on the eastern side of the Production Plant caused by the releasing of steam, and recommended cleaning those areas within the completion time. The Plant Manager agreed to start cleaning that spill the same day. There was a field Notice of Violation filed due to oily spills on the eastern side of the Production Plant. The inspector noted that there was a possibility of ground water contamination but since it was not determined, no recommendation were made on this matter (PAP-00338661). The inspector also noted that the operations and housekeeping appeared to be usual for this type of industry (PAP-00338662).

On January 5, 1985, Franklin Plastics informed the NJDEP that they had removed and disposed of the 25-45 pounds of material from the contaminated area on the eastern side of the Production Plant (PAP-00337303).

On July 22, 1986, NJDEP Bureau of Industrial Site Evaluation conducted a Preliminary Inspection under ECRA Case No. 86026. The inspector noted two deficiencies. First, there were two 20,000-gallon fuel oil tanks located outside the production area within a containment wall. The ground inside the wall was visibly contaminated with oil. Second, there was a wash sink south of the Production Plant which discharged to the ground. The inspector recommended that Franklin remove the contaminated soil and take measures to prevent subsurface contamination. The inspector also instructed that Franklin should cease the discharge to the ground from the wash sink (PAP-00057224).

An EPA contractor's on-site reconnaissance in April 1990, as part of the 1990 EPA SI, discovered three areas of abandoned drums along the Passaic River. The drums were in poor condition and some drums were partially buried. The contents of the drums appeared to be crumbled pieces of tile. Solidified sludge from the vinyl tile manufacturing process was also observed on the Property. According to the report, the former operator of the property, Congoleum Corporation/Floor Covering Division, manufactured asphalt and/or vinyl tile on site from approximately 1946 to 1974 (PAP-00337307; PAP-00054201-02). Based on the available file materials, there is no evidence that Franklin Burlington manufactured tile at any point during its operation from 1976 to 2010.

The site was also subject to periodic permit Compliance Evaluation and Assistance Inspections by the NJDEP. The NJDEP inspector noted no major deficiencies and found the Facility to be in compliance with requirements of the Facility's NJPDES permits based on the inspections and analysis of wastewater on multiple occasions, such as the inspections conducted on March 12, 1980 (PAP-00057289-90), March 29, 1982 (PAP-00057293-94), April 16, 1996 (PAP-00057311-12), and March 4, 2009 (PAP-00057405), among others. While some inspections reported that the Facility was not in compliance with one of the terms of its permits, none of the incidents of non-compliance related in any way to the storage, handling, or discharge of an OU2 COC (PAP-00057306; PAP-00057315; PAP-00057342; PAP-00057351-57).

NJDEP also inspected the Facility annually pursuant to the Discharge Prevention, Containment and Countermeasures and Discharge Cleanup and Removal Plans annual audit requirement. The available records for five of the inspections show that there were no violations found, and the Facility was in compliance when inspected on November 27, 2001 (PAP-00055147), November 21, 2002 (PAP-00055148), August 12, 2004 (PAP-00055297) and July 12, 2007 (PAP-00055348), and the Facility was substantively in compliance when inspected on November 30, 2000 (PAP-00055146).

Violations

According to the 1990 EPA SI, at an unknown date Franklin Plastics received a Notice of Violation for oily spills along the eastern wall of the Production Plant (PAP-00337303).

According to a NJDEP letter dated September 27, 1985, the NJDEP Division of Water Resources, inspected the facility in July 1985 and gave it an "unacceptable" rating due to permit limit exceedances of temperature, chromium, and zinc concentrations. The letter mandated that Franklin Plastics Corporation submit a written report detailing remedial

measures and an implementation timetable (PAP-00057085-89;). According to a letter from Franklin Plastics to NJDEP, dated October 22, 1985, after conversations with NJDEP about the exceedances, Franklin Plastics resampled the water and all constituents were below the levels required by the permit (PAP-00057090).

NJDEP sent a letter to Franklin Plastics Corporation in June 1998 notifying them that they had not received a response pertaining to a Declaration of Environmental Restrictions and a proposed Groundwater Classification Exception Area for the site. Franklin Plastics was notified that the company was currently in violation of ISRA and NJDEP, and was therefore permitted to draw upon the posted financial assurance to proceed with the appropriate compliance and enforcement actions, if it so chose. The ISRA Case number was No. E86026 (PAS-00105243-44).

The site was placed on the Known Comprehensive Site List, a listing of all contaminated sites in New Jersey. NJDEP additionally rescinded approval of the Remedial Action Workplan, dated August 22, 1990, because aerial photographs from 1940 to 1991 showed that all potential areas of environmental concern were not identified during the investigation phase. Areas of concern not identified included storage areas (possible drum and other vessels) throughout the site, and spills/discharges or unknown materials. These areas were not investigated during the Site Investigation/Remedial Investigation, nor were they addressed in the Remedial Action Workplan (PAS-00105243-44).

NJDEP also noted that an EPA evaluation report, dated September 20, 1995, and NJDEP files state that Franklin Plastics site operations contributed to the metals in soil at the site. A sediment sample collected from the open sump at the southern side of the manufacturing building exhibited significant concentrations of metals. According to the NJDEP, these metals could only have been generated from within the plant since the sump collects process water generated only from within the plant. The sump reportedly is cleaned out annually by Franklin Plastics. The metals detected in the sump sediment are generally the same metals contained within pigments reportedly used by Franklin Plastics. These metals are also generally the same metals as those found in the fill onsite (PAS-00105244).

In order for Franklin Plastics to be in compliance with ISRA according to NJDEP, they were to: 1) make a distinction between metals in fill due to site operations and metals in contaminated Historic Fill, 2) identify all potential areas of concern based on the aerial photographs and EPA SI and evaluate the remediation conducted at the site, 3) submit a Remedial Action Workplan that:

- identifies all potential and known areas of concern;
- evaluate previous remediation;
- evaluate the source of priority pollutant metals onsite;
- conduct a baseline ecological evaluation; and,
- Conduct a draft Declaration of Environmental Restrictions and Classification Exception Area (PAS-00105244-45).

In response to the June 3, 1998 letter, Franklin Plastics submitted a Remedial Investigation Report dated February 5, 1999 (1999 RIR) (PAP-00054673). In a letter dated February 8, 2000, NJDEP stated that it had rescinded Franklin Plastics Corporation's Remedial Action Workplan, dated August 22, 1990, and referred the case to the Bureau of Federal Case Management for enforcement actions due to Franklin Plastics Corporation's lack of response to outstanding NJDEP administrative requirements. In the same letter, the NJDEP indicated what Franklin Plastics would need to do to come into compliance and provided associated comments on the 1999 RIR (PAP-00054673-85). All of NJDEP's comments were responded to and ultimately resolved by the submission of subsequent ISRA/ECRA filings, culminating in the submission of the 2016 PARS RIR (PAP-00056115-466).

Permits

<u>*NJPDES NJ0002194 - Discharge to Surface Water Permit:*</u>

Permit Start Date: 04/24/1976 (PAP-00057096)
Expiration Date: 09/30/2004 (PAP-00057276)

Permit No. NJ0002194 did not contain any numerical effluent limitations involving OU2 COCs nor did it require monitoring for any OU2 COCs (PAP-00057123; PAP-00057169; PAP-00057178; PAP-00057234).

Permit No. NJ0002194 was renewed with the effective of August 1, 1979 and an expiration date of July 31, 1984 (PAP-00057122).

According to the Application for Renewal of NJPDES NJ0002194, dated July 31, 1984, the operations that contributed to the discharge were overflow from cooling tower; discharge from cooling system of Henschel Blender in lab; and overflow from central collection tank, which would have an average maximum flow of 250 gallons per minute (PAP-00337952).

In June 1985, Franklin Plastics Corporation received a letter from NJDEP, Division of Water Resources, acknowledging that Franklin Plastics had a Final NJPDES/DSW Permit and Notice of Authorization to discharge pollutants to the Passaic River under NJPDES Permit No. NJ0002194 (PAP-00057149). The permit was issued on June 28, 1985, effective August 1, 1985 and expired on July 31, 1990 (PAP-00057150).

According to the Application for Renewal of NJPDES NJ0002194, dated November 1, 1989, the operations that contributed to the discharge were overflow from cooling tower (normally no flow); discharge from cooling system jacket laboratory Henschel Blender (occasional use, normally inoperative, 1,000 gallons per day average flow); overflow from central collection tank (normally no flow); and air compressor cooling (200 gallon per hour average flow) (PAP-00337981).

A renewal of Permit No. NJ0002194 was issued on March 13, 1992 with an effective date of May 1, 1993 and an expiration date of April 30, 1997 (PAP-00057176). According to the Application for Renewal of NJPDES NJ0002194, dated April 22, 1997,

the operations that contributed to the discharge were overflow from cooling tower (normally no flow); discharge of cooling water jacket from laboratory Henschel Blender (normally inoperative, 1,000 gallons per day average flow); overflow from central collection no-contact cooling (normally no flow); and air compressor cooling jacket (200 gallon per hour, 16 hour operation average flow) (PAP-00057203).

A renewal of Permit No. NJ0002194 was issued on November 26, 1997 with an effective date of January 1, 1998 and an expiration date of December 31, 2002 (PAP-00057225). The permit stated that the Facility discharged an average of 11,124 gallons per day of non-contact cooling water from machinery used in plastics processing and contact cooling water (approximately 450 gallons) on an intermittent basis from tanks where plastic resins have been submerged through Discharge Serial Number (DSN) 001 (PAP-00057233).

According to the Application for Renewal of NJPDES NJ0002194, dated December 30, 2002, the operations that contributed to the discharge were discharge of noncontact cooling water at an average flow rate of 11,124 gallons per day and discharge of contact cooling water at an average flow rate of 0.00015 million gallons per day (PAP-00338016). The average frequency of the flow through outfall number 0001A was reported as 2 days per week, with an average monthly volume of 4,500 gallons (PAP-00338017).

In May 2004, the permitted direct discharge pipe to the Passaic River was capped at both ends, and the cooling water flow was redirected to the PVSC collection main along Passaic Avenue. On October 21, 2004, Spartech Polycom requested that NJDEP terminate the processing of the pending permit re-application and revoke permit No. NJ0002194 (PAP-00338061). By letter dated October 29, 2004, NJDEP administratively revoked Permit No. NJ0002194, effective September 30, 2004 (PAP-00057276).

According to the 1990 EPA SI, NJPDES Permit No. NJ0002194 approved 15,000 gallons of discharge per day into the Passaic River via outfall DSN001 located at the southwest corner of the property (PAP-00337304).

NJPDES NJ0088315 Industrial Storm water General Permit:

Permit Start Date: 1992 (PAP-00337719)
Expiration Date: 11/01/2002 (PAP-00056668; PAP-00056675)

Permit No. NJ0088315 did not contain numerical effluent limitations or monitoring requirements involving COCs or any other parameters (PAP-00337717-45).

On January 14, 1997, Franklin Burlington Plastics, Inc. submitted a Request for Authorization under NJPDES Industrial General Permit No. NJ0088315 to discharge stormwater from its thermoplastics compounding plant at 113 Passaic Avenue (PAP-00056623-28). On February 6, 1997, Franklin Burlington Plastics Request for Authorization, under NJPDES General Permit No. NJ0088315, was approved by the Bureau of Nonpoint Pollution Control of NJDEP. The Authorization to Discharge Stormwater to Surface Water was effective February 6, 1997 and expired on November

1, 1997 (PAP-00337715). Franklin Burlington Plastics' Authorization to Discharge under NJPDES General Permit No. NJ0088315 was approved again on May 5, 1997 with an expiration date of January 31, 2002 (PAP-00337718). The permit allowed all new and existing storm water discharges associated with industrial activity (PAP-00337724).

A renewal of Franklin Burlington Plastics Authorization to Discharge under General Permit No. NJ0088315 was issued on September 5, 2002, with an effective date of June 1, 2002 and an expiration date of May 31, 2007 (PAP-00056644). NJDEP revoked Franklin Burlington Plastics Authorization to Discharge under General Permit No. NJ0088315 on the effective date of NJDEP's authorization of the individual stormwater permit for the Facility (PAP-00056668).

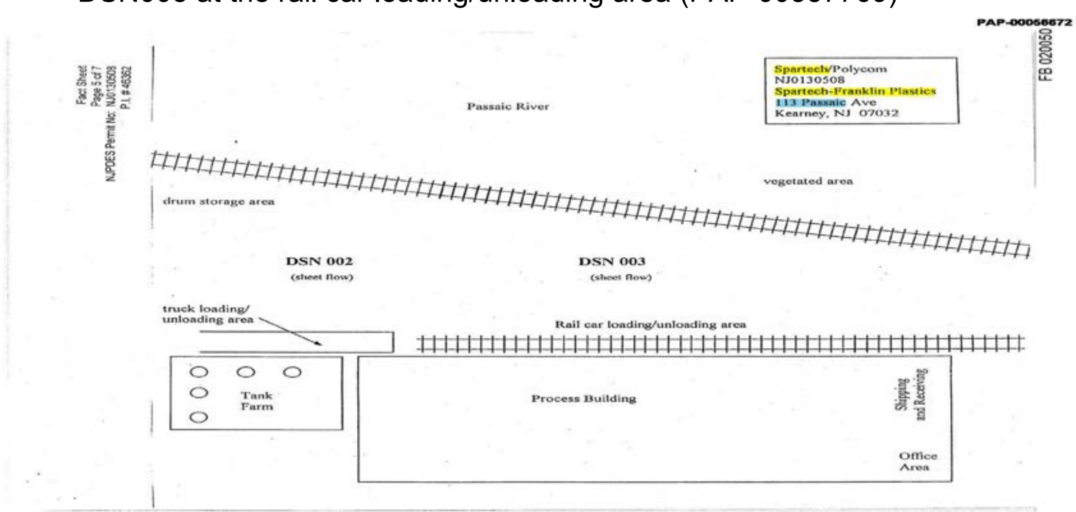
NJPDES NJ0130508 Individual Industrial Storm Water Permit:

Permit Start Date: 11/01/2002 (PAP-00056675)
Expiration Date: 03/31/2010 (PAP-00057091)

Individual Industrial Storm Water Permit No. NJ0130508 did not contain any numerical effluent limitations involving OU2 COCs, but did require the reporting of sampling results for O&G, COD, TSS, pH, phosphorus, lead, and zinc (on a quarterly basis) and volatile organic hydrocarbons (biannually) (PAP-00056669; PAP-00056940-42; PAP-00056960; PAP-00056985). The requirement to report a numerical value for O&G was removed from the permit on June 19, 2006 (PAP-00056933). In addition, the permit required a Stormwater Pollution Prevention Plan to be implemented at the Facility (PAP-00056669).

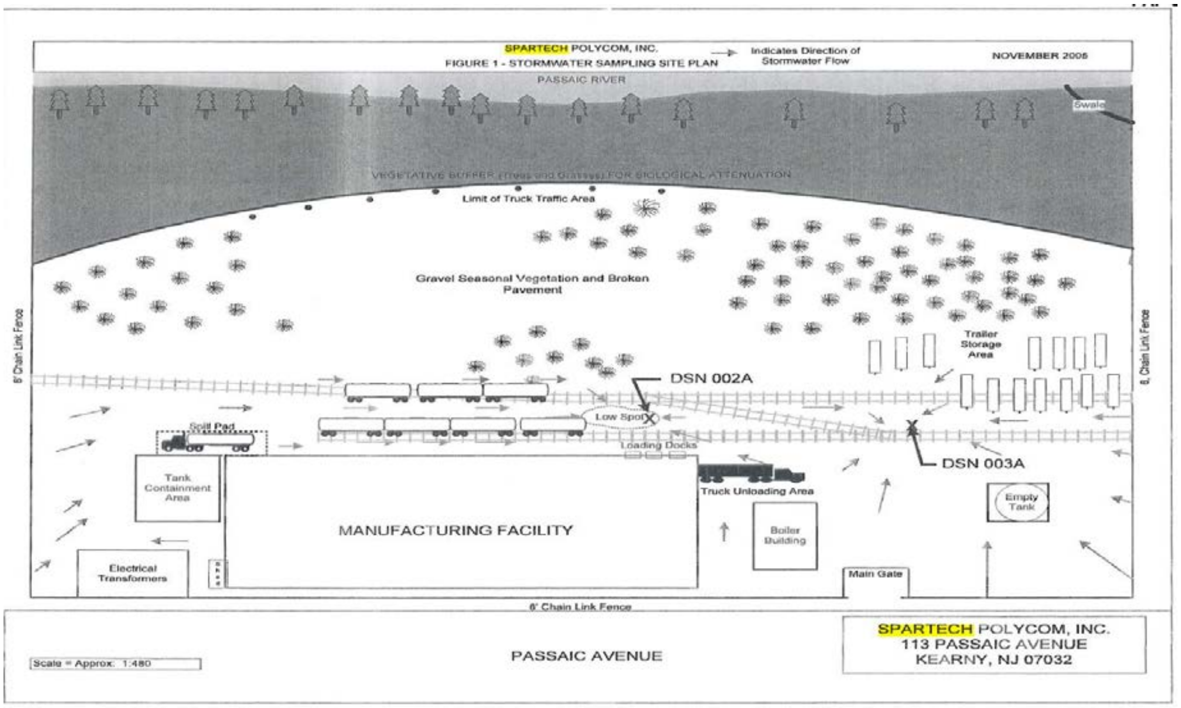
According to the permit issued October 15, 2002, Spartech was required to monitor its storm water discharge from the following DSNs (drainage areas not served by stormwater outfalls): See the following Site Plan from the Fact Sheet of the permit issued October 15, 2002 for the locations of the DSNs.

- DSN002 between the drum storage area and the tank farm
- DSN003 at the rail car loading/unloading area (PAP-00337769)



(PAP-00056672)

At some point prior to the first Discharge Monitoring Report submission required under the permit, the monitoring locations were changed to DSN002A (drum storage area/down-gradient from the tank farm and rail car area) and DSN003A (loading and unloading area/between the loading dock and trailer storage area) (PAP-00056933, PAP-00056939). See the following November 2005 Site Plan for the locations of these DSNs.



(PAP-00337773)

Surface Water Discharge Monitoring Report forms were submitted quarterly to the NJDEP Division of Water Quality, beginning with the fourth quarter of 2002 through the fourth quarter of 2010.

Surface Water Discharge Monitoring Report for monitoring period of April 1, 2008 to June 30, 2008 stated the following:

- Effluent gross value - concentration of lead at 31.2 µg/l. The sampling location was 002A located by the tank farm/rail car (PAP-00338085).
- Effluent gross value - concentration of lead at 90.4 µg/l. The sampling location was 003A located by the loading dock (PAP-00338088)

Surface Water Discharge Monitoring Report for monitoring period of January 1, 2010 to March 31, 2010 stated the following:

- Effluent gross value - concentration of lead at 2.4 µg/l. The sampling location was 002A located by the tank farm/rail car (PAP-00338095).
- Effluent gross value - concentration of lead at 1.1 µg/l. The sampling location was 003A located by the loading dock (PAP-00338098).

Surface Water Discharge Monitoring Report for monitoring period of October 1, 2010 to December 31, 2010 stated the following:

- Effluent gross value - concentration of lead at 2.4 µg/l. The sampling location was 002A located by the tank farm/rail car (PAP-00338115).
- Effluent gross value - concentration of lead at 128.0 µg/l. The sampling location was 003A located by the loading dock (PAP-00338118).

By letter dated August 8, 2011, NJDEP confirmed that Franklin Burlington Plastics was no longer performing any activities requiring a permit under the NJPDES permitting program and administratively revoked NJPDES Permit No. NJ0130508 effective March 31, 2010 (PAP-00057091).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Preliminary Site Assessment dated September 1984 (PAP-00057067);
- Sampling and Analysis Plan Results Report - ECRA Case No. 86206 dated October 1, 1987 (PAP-00337251; PAP-00337406);
- USEPA Site Inspection Report prepared by NUS Corporation dated September 17, 1990 (PAP-00337300);
- Remedial Investigation Report dated June 28, 2002 (PAP-00402442);
- Remedial Investigation Report dated July 14, 2004 (PAP-00402497);
- NJDEP Site Remediation Program Preliminary Site Assessment dated December 2010 (PAP-00054628);
- Receptor Evaluation Report dated June 29, 2011 (PAP-00337542);
- Remedial Action Report, Kearny Passaic Ave Waterfront BDA, Site Investigation Report, dated August 9, 2013 (PAP-00337659);
- Remedial Investigation Report, dated March 2016 (PAP-00056115);
- Former Transformer Substation Remedial Action Report, dated June 2017 (PAP-00056559); and,
- Interim Remedial Measures (IRM) Report and Remedial Action Workplan (RAW) dated October 2017 (PAP-00055492).

According to the 1984 Hart PSA, four soil samples were collected for chemical analysis and subsurface soil samples were collected for physical inspection and OVA analysis. One surface sample consisted of a composite of several samples in a spill and vegetative stress area near the air pollution control units, and the other three samples were collected inside the tank containment area (PAP-00057068).

Composite Sample: The surface soils of the locations chosen for the composite chemical sample were described as black, compact, and largely composed of fine sandy silt with large amounts of debris such as plastics, broken bottles, metal scraps, bricks, etc. At one of the composite sample locations, C1-A, the soils were covered with a silvery material (PAP-00057070).

Tank Containment Area: This area consisted of a square concrete walled structure within which was five columnar tanks formally used (by the previous owner of the Facility, Congoleum Corporation) for asphalt storage. One or two tanks were used in the plastics manufacturing process. Around the base of the tanks, and formerly covering a majority of the containment area, were solidified asphalt flows. Surface samples and test pit locations were selected to provide as fairly even distribution as well as possible worst case conditions (PAP-00057070).
A January 10, 1986 ECRA Initial Notice General Information Submission (GIS) was submitted to NJDEP for ECRA review due to the pending sale of all issued and outstanding stock of Franklin Plastics Corporation to Spartech-Franklin Plastics (PAP-00337241).

On February 14, 1986, Franklin Plastics entered into an Administrative Consent Order (ACO) with the NJDEP since Franklin Plastics Corporation was not able to comply with all of the requirements of ECRA and the Regulations prior to date of sale. Therefore, Franklin Plastics Corporation requested that NJDEP prepare an ACO which allowed the transaction to be consummated prior to the completion of all administrative requirements. The ACO required that Franklin initiate, complete, and submit to NJDEP the results from any NJDEP-approved Sampling Plan. The ACO also provided that if a Cleanup Plan was required, the Cleanup Plan shall address remediation of any contamination identified on or from Franklin Plastics Facility (PAP-00337244-46).

On March 25, 1987 NJDEP, Bureau of Environmental Cleanup and Responsibility Assessment (BEECRA) approved the SAP and SAP Amendments submitted on March 18, 1986 and February 12, 1987, respectively (PAP-00337272).

The 1987 RECON SAP Results report - ECRA Case No. 86206 identified the following environmental areas of concern:

- Area 1 - 50,000-gallon fuel tank;
- Area 2 - 275-gallon aboveground fuel tanks;
- Area 3 - 6,000-gallon underground gasoline tank;
- Area 4 - Discharge sump covered by NJPDES and Drywell;
- Area 5 - Plasticizer Tank Farm;
- Area 6 - Expansion Chamber and Contaminated Soils;
- Area 7 - Loading/Unloading Area;
- Area 8 - Dust Collector and Former Material Storage Area;
- Area 9 - Boiler Blowdown Discharged to Soils;
- Area 10 - Discharge Sink;
- Area 11 - The transformer substation; and,
- Area 12 - Random Sampling (PAP-00337251-70).

The 1987 RECON SAP Results report - ECRA Case No. 86206 made the following conclusions:

- The data showed that soil contamination is present on site however; it appears that shallow groundwater has not been materially impacted.

- Specific contaminants found were phthalates; polynuclear aromatic hydrocarbons (PAHs); lead; and cadmium.

- PAHs were found at various locations on the Site. Also found throughout the fill were coal cinders and ash. Coal cinders and ash are associated with PAHs which could account for the detection of PAHs.

- Phthalates were most often associated with areas where plasticizer oils were stored or loaded and were also found in areas where fugitive dusts may settle. (PAP-00337297)

The 1990 EPA SI identified the following Waste Management Areas and Areas of Concern:

- Stained Soil Area No. 1 located southwest of Blower Pad;
- Stained Soil Area No. 2 located east of Expansion Chamber;
- Noncontact Cooling Water Discharge under NJPDES Permit No. NJ0002194;
- Tank Farm Area located at the Plasticizer Tank Farm; and,
- Abandoned Drums and Sludge Pile (PAP-00337303).

According to the 1990 EPA SI, previous studies included an ECRA Investigation that involved installing seven onsite monitoring wells; collecting core samples to a depth of 6 to 12 inches below ground surface and at a depth of 6 inches above groundwater; and collecting 33 soil borings from depths ranging between 6 to 74 inches (PAP-00337307-08). In 1990, NUS Corporation Region 2 FIT collected four sediment and nine surface soil samples from the Franklin Plastics Corporation site. Two of the four sediment samples were collected from two storm drains bordering Franklin Plastics Corporation on Passaic Avenue (PAP-00337311). The 1990 EPA SI noted that at the time of the report, Franklin was implementing a second phase of ECRA sampling which involved the installation of three deep production wells and collection of six additional soil borings (PAP-00337324).

According to the letter summarizing the Site Inspection Prioritization Evaluation, dated September 29, 1995, quality assurance/quality controls were unknown for soil samples collected as part of the 1984 for the Preliminary Site Assessment, the 1986 ECRA Investigation (which also lacked adequate background sampling), and the 1990 ECRA Investigation (PAP-00054202).

According to the 2004 LFR Remedial Investigation, activities for the remedial investigation included the delineation of impacted soils identified at the former dust collector/drum storage areas (collectively known as Area 8) and the former boiler condensate transfer chamber; investigation of soil conditions beneath and downgradient of Sump No. 2 (Area 4); and documentation of an adequate physical boundary immediately east of the site within the Passaic Avenue road bed, to prevent lateral migration of impacted soils identified onsite (Areas 5 and 6). In addition, pursuant to the NJDEP letter dated July 17, 2003, a "hot spot" was excavated at the location of former soil sample SB13, near the southwestern corner of the site (PAP-00402506).

From November 2003 through February 2004, LFR excavated soil from the southwestern corner of the site and collected post-excavation soil samples. LFR also collected soil samples at other locations for the purpose of delineation and/or investigation, and consulted with Kearny and Hudson County officials regarding the construction specifications of the roadbed for Passaic Avenue, a manmade barrier to contaminant migration immediately east of the site (PAP-00402501).

Soil sample results for the post-excavation samples collected from the excavation state significant removal of the impacted soils, to which elevated total petroleum hydrocarbon (TPH) concentrations had previously been attributed. Although PAH concentrations were identified in post-excavation samples at concentrations exceeding the NJDEP Restricted Use Soil Cleanup Criteria (RUSCC), there is not a direct correlation between the PAH and TPH concentrations, thus confirming that the PAHs are present as the result of historic fill material (PAP-00402501).

Select compounds specifically analyzed to delineate the former boiler condensate transfer chamber were detected at concentrations below the UUSCC, thus completing delineation of these compounds previously identified in the vicinity of the transfer chamber. Soil samples collected to vertically delineate existing data for Sump #2 and to investigate conditions beneath and downgradient of the sump's base confirmed that the concentrations of detectable compounds are below the UUSCC, thus completing delineation of this area (PAP-00402501-02).

Soil samples collected towards the center of the property for delineation near the center of the site (Area 8) confirmed the presence of PAHs at concentrations in excess of the UUSCC in four of the five samples collected. Concentrations detected historically throughout Area 8 and other areas onsite confirm a randomness to the concentrations in relation to one another, indicative of the historic fill at the site. Select metals analysis for soil samples collected in this location were detected at concentrations below the RUSCC with one exception. Sample location SB32, which was collected to delineate Area 8 to the south, contained a lead concentration of 640 mg/kg, which marginally exceeds the RUSCC of 600 mg/kg. However, based on the absence of a consistent trend with regards to lead concentrations detected laterally and vertically sitewide, there is a randomness to the presence of elevated lead concentrations, as expected, based on the historical filling on-site (PAP-00402502).

It was concluded by LFR based on the findings, the delineation of all remaining AOCs has been completed. The implementation of engineering controls (i.e. asphalt cap or vegetative cover, fencing) and institutional controls (i.e. Deed Notice) are proposed to prevent exposure to the impacted soils and close this ISRA case (PAP-00402502).

According to the Preliminary Assessment Report prepared for the NJDEP Site Remediation Program dated December 20, 2010 (2010 NJDEP PAR), the 1986 acquisition was subject to the NJDEP Industrial Site Recovery Act (ISRA) and Case No. 86026 was assigned. When Franklin-Burlington Plastics ceased operations on February 16, 2010, it triggered the requirement to comply with ISRA. The 2010 NJDEP PAR was prepared to comply only with Franklin-Burlington Plastics, Inc. ISRA obligations in

support of the waiver request and covers the period from March 1986 to February 26, 2010 (PAP-00054628).

According to the Receptor Evaluation Report (RER) prepared by ARCADIS dated June 29, 2011 (2011 ARCADIS RER), from 2002 to 2004, ARCADIS U.S., Inc. (formerly known as LFR, Inc.) implemented a Remedial Investigation Workplan. The remedial investigation included soil sampling to delineate concentrations of BNs and metals in excess of the RUSCC to the property boundaries, inspect/investigate process water sumps and former boiler condensate chamber, and to collect sediment samples from the Passaic River. Analytical results for the sediment samples SB-15, SB-16, SB-17 and SB-18 collected immediately to the west of the site beyond the low tide line in the Passaic River confirmed that any potential contaminant sources previously identified on the Site have minimal, if any, impact upon the Passaic River (PAP-00337566).

According to the 2016 PARS RIR, AOC 1 was the 50,000-gallon No. 6 Fuel Oil Aboveground Storage Tank located on Block 1, Lot 12.01 (143 Passaic Avenue). Kleinfelder removed the tank and associated underground piping on behalf of the owner (not Franklin-Burlington Plastics) in April 2012 along with approximately five cubic yards of impacted soil. Benzo(a)pyrene was detected at a concentration that exceeded RDCSRS, and approximately ten cubic yards of soil were excavated in July 2012. Post-excavation soil samples identified no benzo(a)pyrene concentrations that exceeded RDCSRS (PAP-00056124).

Following soil investigation activities in 2013 and 2016, PARS Environmental determined that no further action or investigation was required for the 50,000 gallon No. 6 Fuel Oil AST (AOC 1); the discharge sump covered by NJPDES and drywell(s) (AOC4); floor drains, trenches and piping (AOC 6), boiler blowdown discharge to soil/transfer chamber (AOC 9), discharge sink (AOC 10), railcars and railroad spur (AOC 14), the spill area (AOC 22), the drum storage area (AOC 23) and the sludge pile (AOC 24). Remedial action in the form of engineering controls and a deed notice were required at the plasticizer tank farm (AOC 5) and unloading area (AOC 7) and remedial action was required at the transformer substation (AOC 11) (PAP-00056137-44). The fill area required remedial action to address Historic Fill contamination. Engineering and institutional controls were required to address the historic fill which is located throughout entire Site (PAP-00056159). All remaining structures at the Site were demolished in April 2014 (PAP-00056148-49).

The 2016 PARS RIR also identified a discharge sink in the Production Plant that discharged to the ground surface outside the Production Plant, adjacent to Sump 2 (AOC 10) (PAP-00056130). The Site Inspection Report prepared by NUS in 1990 referenced three drum storage areas were identified in the 1990 EPA SI in the northwest portion of the site with the drums reportedly in poor condition and partially buried. Contents of the drums appeared to be crumbled pieces of tile associated with the former Congoleum Corporation asphalt and vinyl tile plant. There was also a solidified sludge pile near the drum storage area identified in the 1990 EPA SI that was associated with Congoleum Corporation (PAP-00056135; PAP-00337307).

Remedial Activities

According to the Final Report on Cleanup Plan (CUP) Implementation and Finalization of ECRA/ISRA Responsibilities, Franklin Plastics Corporation submitted a CUP to NJDEP on August 22, 1990. The CUP proposed combining areas of environmental concern (AEC), encapsulating AECs 1 and 2 and encapsulation with pavement and recovering free product from a monitoring well. NJDEP required delineation of non-aqueous phase liquid (NAPL) near monitoring well MW-1 before approval (PAS-00063475). The approved CUP acknowledged NJDEP's approval of partial capping and use restrictions. Areas of Concern 1-12 were either encapsulated, capped, or received no further action, except Area 7 which required secondary containment pursuant to the Facility's Spill Prevention, Control, and Countermeasures Plan (PAS-00063480-82). With submission of the final CUP, final site inspection and institutional control approval, Franklin Plastics would satisfy all ISRA requirements (PAS-00063477).

The 1994 Final Report on Cleanup Plan Implementation and Finalization of ECRA/ISRA Responsibilities stated Areas 1 through 8 and the Tank Farm Area were encapsulated as required per the NJDEP final cleanup plan approval letter dated June 17, 1993. A secondary containment berm (to facilitate transfer of plasticizer oils from trucks) was constructed, as required by the Facility's SPCC Plan (PAS-00063471; PAS-00063488-92).

In August 2013, Kleinfelder submitted an unrestricted use Response Action Outcome for AOC-1 - 50,000-gallon No. 6 Fuel Oil Aboveground Storage Tank located at 143 Passaic Avenue, Block 1, Lot 12.01. It was concluded that remediation had been completed in compliance with the Administrative Requirements for the Remediation of Contaminated Sites N.J.A.C. 726C that is protective of public health, safety, and the environment. (PAP-00337614-16).

According to the *Former Transformer Substation Remedial Action Report (RAR), Volume 1 of 2*, prepared by PARS Environmental and dated June 2017 (the 2017 PARS RAR), the Transformer Substation contained five transformers, 2 circuit breakers and 17 bushings, that was decommissioned in 2013. The transformer oil was transported to Veolia ES Technical Solutions in Fort Arthur, Texas, and solids were transported to Chemical Waste Management located in Emelle, Alabama. Between December 2013 and March 2015 PARS Environmental, Inc. installed 29 borings within the area of the former transformer substation. A soil sample was collected from each location at the ground surface or at the 0.5 foot depth intervals immediately beneath the gravel layer. PCBs were detected in one sample at a concentration of 2.05 mg/kg. Low concentrations of PCBs were detected in three samples. PCBs were not detected in the remaining samples above the laboratory MDLs (PAP-00056565). In 2014, Dallas Industrial Services, Inc. demolished structures at the site that included the concrete pads, supports and the switchgear house for the former transformer substation (PAP-00056566). Remediation activities from three impacted areas within the transformer substation was performed between March 20 and 27, 2017. Post-excavation soil samples were collected from each excavation and analyzed for EPH and PCBs. PCBs were not detected in any of the samples above the laboratory MDLs from the PITTS and K-14306 Transformer Area. At the K-14463 Transformer Area, PCBs were detected at a

concentration of 0.22 mg/kg in sample No. 016, which slightly exceeded the most stringent Soil Remediation Standard of 0.2 mg/kg. PCBs were not detected above the laboratory MDL in the remaining post-excavation soil samples. The excavation was extended, and three additional soil samples were collected. PCBs were not detected in the additional post-excavation soil samples above the laboratory MDLs. At the K-14098 and K-14301 Transformer Area, PCBs were detected on one post-excavation soil sample at a concentration of 0.12 mg/kg, which was well below the most stringent Soil Remediation Standards. PCBs were not detected in the remaining samples from this excavation above the laboratory MDLs. A total of 103.38 tons of soil was excavation as part of the remedial action and transported to Pure Soil Technology in Jackson, New Jersey (PAP-00056568-70; PAP-00056575-76).

On February 12, 2019, a Deed Notice was issued for the property at Block 1, Lot 12, (7.82-acres), by the 113 Passaic Avenue Urban Renewal, LLC, (the current owner of the property) because Franklin Burlington Plastics, Inc. and 113 Passaic Avenue Urban Renewal, LLC have remediated contaminated soil at the site, such that soil contamination remains at certain areas of the property which contains contaminants in concentrations that do not allow for the unrestricted use of the property. Due to the presence and concentration of these contaminants, the current owner has agreed, as part of the remedial action for the site, to restrict the use of certain parts of the property and to the placement of engineering controls on the property. The objective of the institutional control is to provide notification of the impacted soil on the site and notification that the site has been capped with an engineering control to prevent direct contact with the impacted soil, which may contain exceedances of the NJDEP regulatory standards. The objective of the engineering control is to prevent direct contact with the impacted soil, which may contain exceedances of the NJDEP Soil Remediation Standards. The engineering cap, which encompasses the entirety of the residential use portion of the property, consists of the following elements:

- Building Foundation and Concrete: Building Foundation and Concrete elements consist of 4-inch minimum concrete over 4 inches of clean quarry material (or equivalent) with a visible demarcation boundary.

- Asphalt: Asphalt elements consist of 4-inch minimum bituminous surface course over a 4-inch minimum bituminous base course with a visible demarcation boundary.

- Landscape Area: The Landscape elements consist of 24 inches minimum of NJDEP compliant certified clean fill and topsoil material (12-inch barrier and 12-inch buffer layer) underlain by a contaminant boundary marker (geotextile liner).

- Lawn Area and Pavers: The Lawn Areas and Pavers elements consist of 12 inch minimum of NJDEP compliant certified clean fill and topsoil material (6-inch barrier and 6-inch buffer layer) underlain by a contaminant boundary marker (geotextile liner). In the Pavers element areas, approximately 3-inch landscape pavers have been placed over the 12-inch minimum of NJDEP compliant certified clean fill.

- Utility Corridors: The Utility Corridors element consists of 12 inches minimum of NJDEP compliant certified clean fill (6-inch barrier and 6-inch buffer layer) surrounding utilities with a visible demarcation boundary (PAP-00337696-714).

8. Summary of Asserted Defenses

Franklin-Burlington Plastics asserts that FBP cannot be held liable for or be required to pay response costs based on actions or inactions by FBP that arise out of conduct lawfully undertaken in compliance with permits or other approvals issued by relevant government agencies. Any discharges of COCs that may have contributed to the contamination of the Lower Passaic River were authorized under permits issued under federal and state laws – the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq.; the Clean Air Act, 42 U.S.C. § 7401 et seq.; the National Pollutant Discharge Elimination System, 40 CFR 122.1 et seq.; the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.; the Air Pollution Control Act, N.J.S.A. 26:2C-1 et seq.; and the New Jersey Pollutant Discharge Elimination System, N.J.A.C. 7:14A-1.1 et seq. In addition, CERCLA's petroleum exclusion is applicable to the FBP Facility.

GARFIELD MOLDING COMPANY, INC.

Facility Name, Address and Size: Garfield Molding Company, Inc. (Garfield), 10 Midland Avenue, Wallington Borough, Bergen County, Block 71, Lot 1 and Block 26A, Lot 13 New Jersey 07057, approximately 3.43 acres (PAS-00102867; PAS-00123366). Garfield Molding Company, Inc., employed 28 people (PAS-00123364). Available references did not include the number of work shifts at Garfield.

1. **Business Type:** The Garfield Molding Company was engaged in the molding of plastics, cement, and other materials for use in the electrical industry (PAS-00123366).

2. **Time Period of Ownership/Operations**

   Operator: 1917 to 2014 (PAS-00123364)
   Owner: 1917 to 2014 (PAS-00123364)

3. **Operational History/COC Use and Presence at the Facility**

   Operations at the Garfield Molding Company principally involved the molding of plastics and other materials for use in the electrical industry (PAS-00123366).

   Types of molding operations conducted at the facility are known to have included (PAS-00123366):

   - Compression molding
   - Custom molding
   - Injection molding
   - Prototype and production runs
   - Thermoset molding
   - Transfer molding

   As reported by the *PRP Data Extraction Form* dated 2005, cold molding, thermal transfer molding, and injection molding are reported as all being "thermoset methods" that involve the heating of thermosetting materials. Cold molded pieces are impregnated with hot paraffin in certain processes at the facility. Operations at the Garfield Molding Site included the following process areas (PAS-00123366-67)

   - Administrative functions
   - Asbestos storage
   - Automotive repair
   - Boiler
   - Box shop
   - Coal storage
   - Drum storage
   - Electrical motor storage
   - Finishing – drill presses and grinders
   - Heat treatment
   - Hemit building
   - Impregnation building
   - Injection molding
   - Laboratory
   - Mixing and blending
   - Mold storage
   - Molding (press)
   - Motor room
   - Oven department – baking and high humidity
   - Pipe shop
   - Pipe storage
   - Power house

- Press department
- Receiving, shipping and inspection
- Sand blasting
- Sewer pump house
- Steel storage
- Storage shed
- Switch room
- Thermoset compounds storage
- Tool and die shop
- Transformers
- Vehicle parking

Manufacturing processes and waste materials used in or generated by site operations include the following (PAS-00123367-68):

- Acetylene
- Aliphatic petroleum distillate
- Alkyd molding compounds
- Ammonia
- Asbestos
- Base resins (homopolymers)
- Bitumen (including uintaute)
- Cement
- Clay
- Cutting oils
- Fiberglass/additives
- Fibrous materials
- Fish oil
- Formaldehyde
- Fuel oil
- Furfural
- Gasoline
- Hydraulic oil
- Hydrocarbon waxes in solvents
- Isopropanol/Isopropyl alcohol
- Lead
- Lubricant/Lubricating Oil
- Melamine – formaldehyde resin
- Melamine-phenol formaldehyde
- Methylene chloride
- Mineral spirits
- Nonhalogenated solvents and still bottoms
- Number 2 fuel oil
- Paraffin
- Phenol formaldehyde polymeric molding compounds
- Polyester molding compounds (styrene based)
- Polyester molding compounds (vinyl toluene based)
- Polyester/alkyd polymeric molding compounds
- Resins/polymeric materials (commercial premixes)
- Tars
- Toluene
- Urea-formaldehyde molding compounds
- Used oil/waste oil
- Vegetable waxes
- Wollastonite

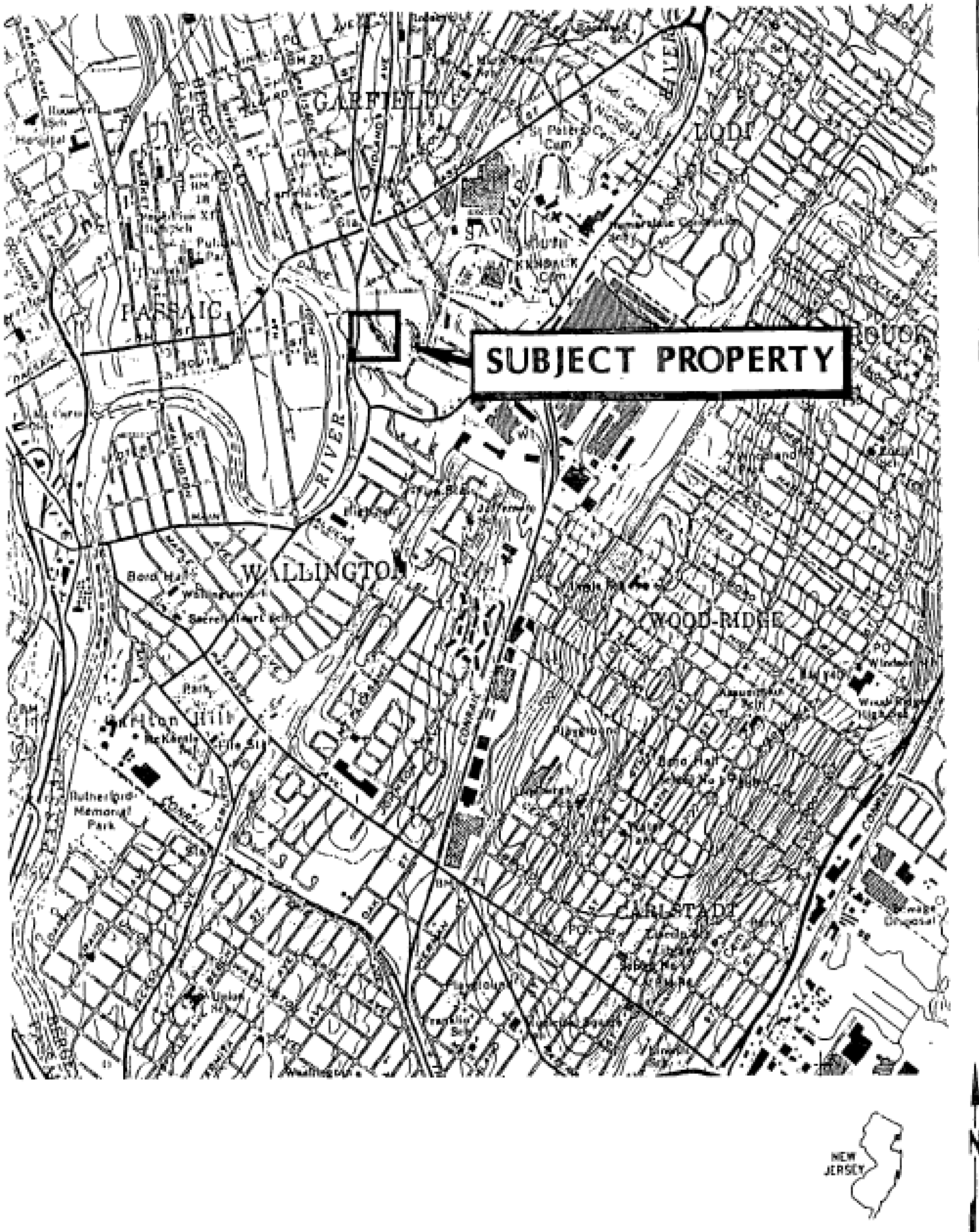


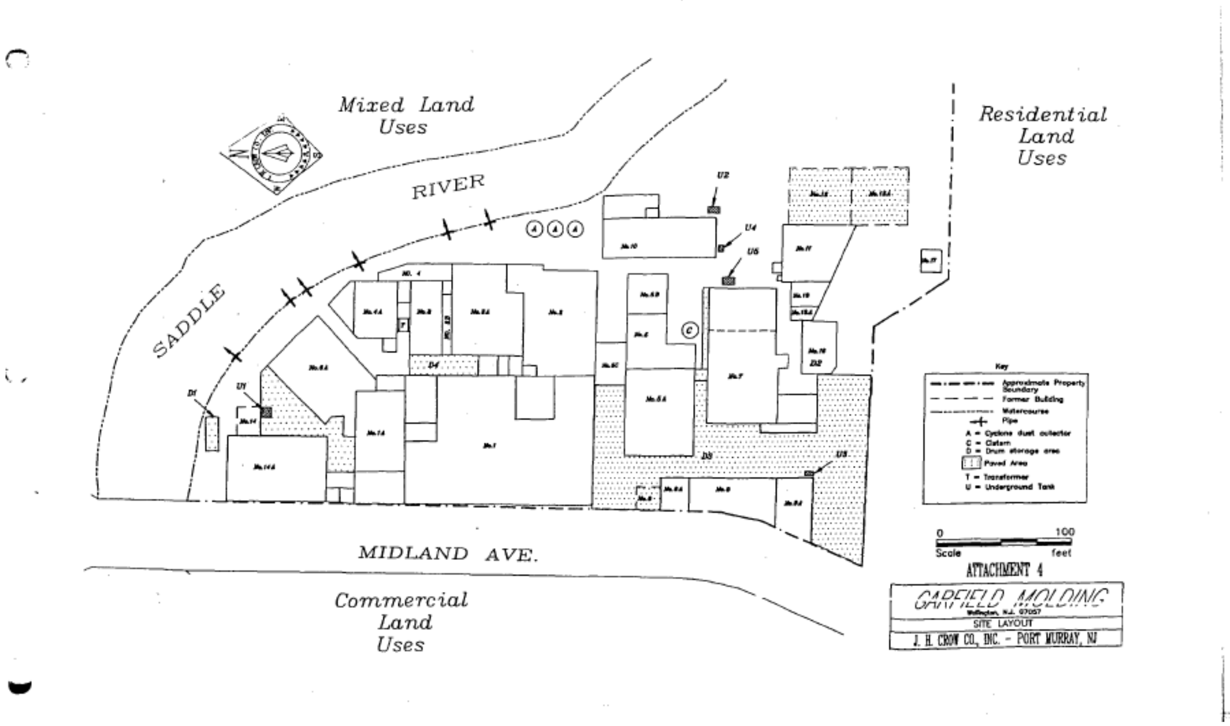
FIGURE 1-1: SITE LOCATION MAP

SCALE 1" = 2000'

EcolSciences, Inc.

-3-

(PAS-00102868)



(PAS-00102959)

According to the *Data Presentation Report for Garfield Molding, ECRA Case 88439*, dated October 19, 1990, Report (1990 Report), a brief description of the manufacturing operations at the Garfield Molding Company with respect to each of the industrial buildings are as follows:

<u>Building 1</u> – Injection presses used for thermal transfer molding of electrical switchboard components. The administrative offices of the Garfield Molding Company are also housed in Building 1 (PAS-00102869).

<u>Building 1A</u> – Building 1A houses mixing operations where water-based compounds are blended for cold molding processes (PAS-00102869).

<u>Building 2</u> – Grinding and polishing machinery associated with finishing operations for the electrical switchboard equipment. Dust from these grinding operations is exhausted from the building via a network of ducts connected to the three cyclone dust collectors found immediately to the rear of the building (PAS-00102869).

<u>Building 3</u> – Storage vault for the molds used in the cold molding of electrical switchboard components (PAS-00102869).

<u>Building 3A</u> – Drying ovens used in conjunction with the cold molding process (PAS-00102869).

Building 3C – Mold storage vault annex (PAS-00102869).

Building 4 – Natural gas fired high pressure steam boiler and hallway space linking cold molding production areas (PAS-00102869).

Building 4A – Impregnating operations associated with the cold molding process and contains two hot wax dip tanks (PAS-00102869).

Building 5 – Second active boiler unit and houses a small pipe fitting shop (PAS-00102869).

Building 5A – Centralized pumping equipment associated with the lubrication system for the thermal transfer molding presses. The injection presses found in Building 1 are interconnected by a common oil lubricating system, with the piping for this system found in a network of concrete troughs beneath the production area floor. Oil lines and oil return sump lines were connected to the pumping equipment in Building 5A via a tunnel connecting Building 1 and 5A (PAS-00102869-70).

Building 5B – Former coal fired boilers which were no longer in service as of 1990 (PAS-00102870).

Building 6A – Additional floor space associated with the preparation of water-based compounds for cold molding processes. Mixing facilities we on the first floor of Building 6A, while raw materials, mainly Type IV Portland cement, were stored on the second floor (PAS-00102870).

Building 7 – Housed the feedstocks used in the thermal transfer molding operations. Used to warehouse finished electrical switchboard components. Chemical feedstocks were stored on the first floor of the building while finished products were stored on the second floor (PAS-00102870).

Building 8A – Vacant storage (PAS-00102870).

Building 9 – Storage of heavy machinery being dismantled as part of the closure activities of the Garfield Molding Company (PAS-00102870).

Building 9A – Miscellaneous storage purposes (PAS-00102870).

Building 10 – Sublet to an automotive repair shop (PAS-00102870).

Building 11 – Open roofed structure that once served as a coal bin for the coal-fired boilers found in Building 5B. Was also used to store automobiles and trucks (PAS-00102870).

Buildings 13 and 13A – Vacant structures (PAS-00102870).

Building 14A – Machine shop facilities for the maintenance of onsite mechanical equipment (PAS-00102870).

Building 16 – Vacant (PAS-00102870).

Building 17 – Sanitary sewer pump station connecting the sewer units from the Garfield Molding Company to the sewer system for Wallington Borough (PAS-00102870).

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (use, storage)
- Lead (use, detected)
- Mercury (detected)

PCBs

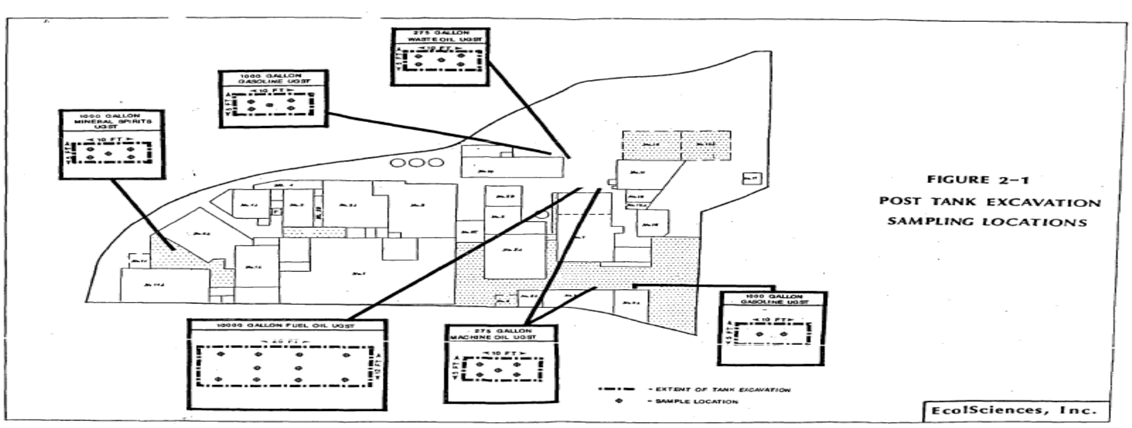
According to the 1990 Report, post tank excavation sampling entailed the collection of soil samples beneath the six underground storage tanks removed from the subject property during June 1990 (PAS-00102880-83).

Post tank excavation soil sampling results revealed an elevated concentration of PCBs (Aroclor-1260) detected in soil beneath the 275-gallon waste oil tank at a concentration of 1,400 μg/kg (Aroclor-1260 in sample T-W-5) (PAS-00102882).

PAHs

According to the 1990 Report, post tank excavation sampling entailed the collection of soil samples beneath the six underground storage tanks (USTs)removed from the subject property during June 1990 (PAS-00102880-83).

Post tank excavation soil sampling results revealed elevated concentrations of PAHs detected in soils beneath the 275-gallon waste oil tank at concentrations ranging from 1,400 to 7,100 micrograms per kilogram (μg/kg) (PAS-00102878-82). The figure below presents the locations of the post tank excavation sampling locations.



(PAS-00102879)

In addition, soil samples were collected beneath three cyclone dust collectors found east of Building 2. Soil samples were also collected adjacent to the former coal gasification tower pads found along the south side of Building 5 (PAS-00102884). Soil samples surrounding the cyclone dust collectors showed elevated concentrations of phenanthrene from 550 µg/kg in sample V1-S2 at a depth of 0-6 inches to 640 µg/kg in sample V1-S3 at a depth of 0-6 inches) (PAS-00102888). The figure below presents the location of the cyclone dust collectors.

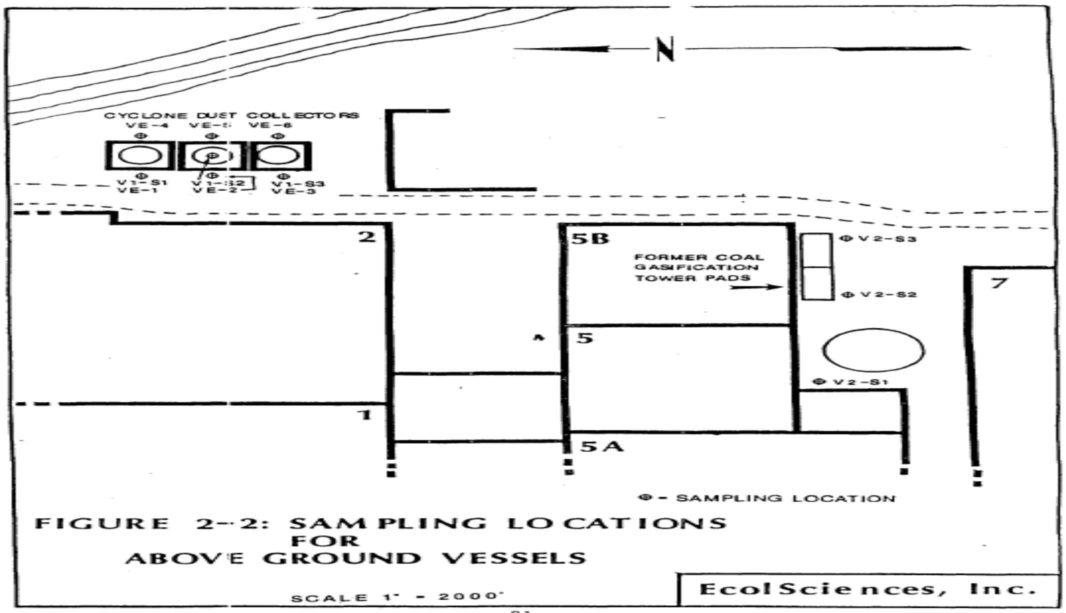


FIGURE 2-2: SAMPLING LOCATIONS FOR ABOVE GROUND VESSELS

(PAS-00102886)

Soil samples were also collected at the former drum storage area. Sampling at the former drum storage areas entailed the collection of shallow surface soils at three temporary drum storage areas having permeable surfaces to determine if leakage or spillage from drums resulted in residual contamination of the underlying soils (PAS-00102890). Soil samples were taken from the former drum storage areas found in the alleyway separating Buildings 1 and 3A (Area D3), adjacent to the north side of Building 14A (Area D4), and adjacent to the northeast corner of Building 11 (Area D5) (PAS-00102890). Soil samples collected from this area revealed concentrations of PAHs ranging from 820 µg/kg (phenanthrene in sample D4-51) to 14,000 µg/kg (pyrene in sample D4-54) (PAS-00102892).

Twelve surface water inlets are connected to four NJPDES-permitted discharge points on the Garfield Molding Company property. Eight catch basins were sampled at the locations where these surface water inlets function as receiving points for site runoff or potential spills (PAS-00102894). Sediment samples collected from catch basins found to the south and west of Building 5A, to the southeast of Building 3A, and to south of Building 16 were used to assess the environmental impact associated with the past storage of drums at these locations. Further, sediment samples taken from the catch basins found to the north of Building 5A, to the east of Buildings 4A and 2, and to the

north of Building 14A were used to assess the potential Impact of site runoff upon the NJPDES-permitted discharge points (PAS-00102894). Elevated concentrations of PAHs were detected in five of eight catch basin sediment samples at concentrations ranging from 2,900 µg/kg (pyrene in sample CB-5) to 34,000 µg/kg (benzo(b)fluoranthene in sample CB-3) (PAS-00102895, 7). The catch basin sampling locations are presented on the figure below:

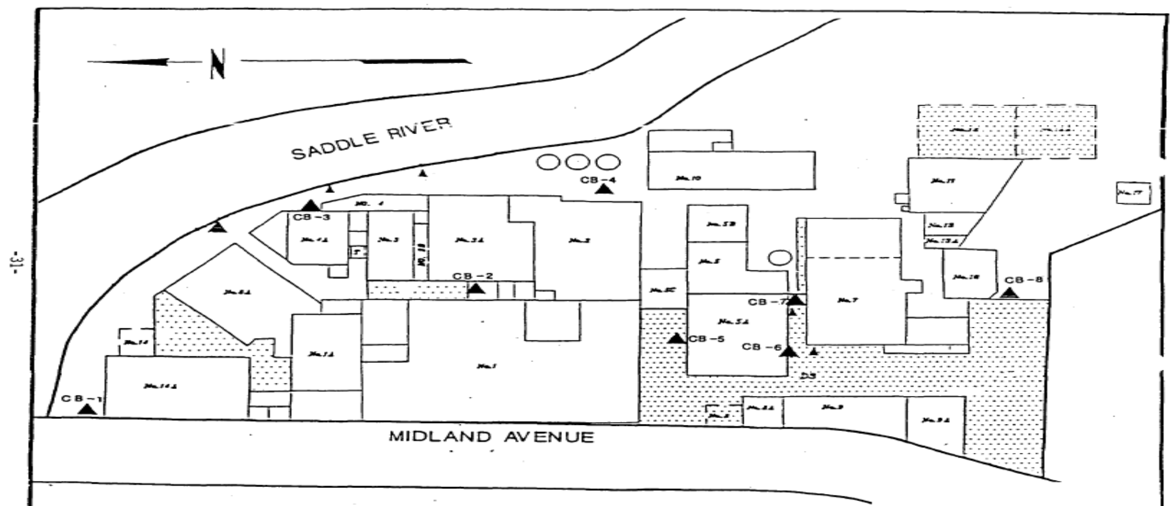


FIGURE 2-4: CATCH BASIN SAMPLING LOCATIONS EcolSciences, Inc.

PAS-00102896

Copper

Soil samples were collected beneath three cyclone dust collectors found east of Building 2. Soil samples were also collected adjacent to the former coal gasification tower pads found along the south side of Building 5 (PAS-00102884). Soil samples surrounding the cyclone dust collectors showed elevated concentrations of copper from 586 to 1,800 mg/kg (PAS-00102887). Post excavation soil samples collected upon removal of potentially contaminated soils surrounding the dust collectors showed concentrations of copper from 704 mg/kg in sample VE-3 at a depth of 24-30 inches to 2,585 mg/kg in sample VE-1 at a depth of 24-30 inches (PAS-00102889). These concentrations are likely attributed to the presence of coal cinders and coal fragments in the soil base supporting the dust collection towers (PAS-00102887-9).

Lead

Soil samples were collected beneath three cyclone dust collectors found east of Building 2. Soil samples were also collected adjacent to the former coal gasification tower pads found along the south side of Building 5 (PAS-00102884). Post excavation soil samples collected upon removal of potentially contaminated soils surrounding the dust collectors showed concentrations of lead from 558 mg/kg in sample VE-6 at a depth of 24-30 inches to 738 mg/kg in sample VE-3 at a depth of 24-30 inches (PAS-00102889). These concentrations are likely attributed to the presence of coal cinders and coal fragments in the soil base supporting the dust collection towers (PAS-00102887, 9).

Lead was listed as a material used at the site, but no further information on how or where it was used was provided in the available references (PAS-00123367-68).

Mercury

Soil samples were collected beneath three cyclone dust collectors found east of Building 2. Soil samples were also collected adjacent to the former coal gasification tower pads found along the south side of Building 5 (PAS-00102884). Post excavation soil samples collected upon removal of potentially contaminated soils surrounding the dust collectors showed concentrations of mercury from 1.0 mg/kg in sample VE-6 at a depth of 24-30 inches to 2.5 mg/kg in sample VE-3 at a depth of 24-30 inches (PAS-00102889). These concentrations are likely attributed to the presence of coal cinders and coal fragments in the soil base supporting the dust collection towers (PAS-00102887).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[1] According to the 1990 Report, Historic Fill was identified during prior investigations conducted at the Garfield Molding Company (PAS-00102872, 83; PAS-00102913, PAS-00102922).

The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00102889, 92).

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	738 mg/kg
Copper	2,585 mg/kg
Mercury	2.5 mg/kg
Benzo(a)anthracene	2.8 mg/kg
Benzo(a)pyrene	3.8 mg/kg
Benzo(b)fluoranthene	5.4 mg/kg
Benzo(k)fluoranthene	2.1 mg/kg
Dibenzo(a,h)anthracene	ND
Indeno(1,2,3-cd)pyrene	ND

5. COC Pathways

Sanitary and Storm Sewer

Sanitary wastewater was discharged directly from Garfield Molding Company to Saddle River from 1908 through 1918 (PAP-00165373; PAS-00102790). In addition, humidity room condensate wastewater was discharged from the Garfield Molding Company to the Saddle River from 1960 through 1988 (PAP-00165373; PAS-00102790). From 1969 through 1974 boiler blowdown wastewater was discharged directly from the Garfield Molding Company to the Saddle River (PAP-00165373; PAS-00102790).

In accordance with NJPDES Permit Number NJ0027146, Garfield Molding Company was permitted to discharge site stormwater runoff through outfalls 001, 002, 003, 004, 005, and 006 (PAS-00102808; PAS-00123371). Available references did not include permit dates, permitted flow rates and effluent monitoring requirements or results.

Available references state that Garfield held Permit NJ0070211. This permit was for discharge of industrial site storm water runoff without toxic and hazardous pollutants to State surface waters, excluding those classified as FW1 or located within the Pinelands Area, from facilities not requiring an individual NJPDES Permit, a DPCC/DCR plan, or treatment other than gravity separation, and in accordance with effluent limitations, monitoring requirements, and other conditions as set forth in Parts I, II, III, and IV of the permit (PAS-00102809). The permit was effective from September 1, 1987 to August 31, 1992. Available references did not include permitted flow rates and effluent monitoring requirements or results.

6. Regulatory History/Enforcement Actions

Violations

According to the 1974 *PVSC Annual Report*, on June 6, 1974, Inspector Cupo inspected Garfield Molding Company. He discovered that one of four active discharge pipes were covered with debris, making it impossible to sample. Two others that were discharging were sampled, and the fourth was a 2-inch boiler blowdown pipe, which discharged at 7:00 A.M. for a short time. In addition, there were three other visible inactive pipes. The

samples of the two cooling water discharges were satisfactory, but the boiler blowdown was polluting, and Inspector Cupo informed Mr. J. Minaberry, Vice President, Mr. Lombardi, Plant Manager, and Mr. LaRose Jr., Safety Manager in addition to uncovering the outlet that was inaccessible to him so that a sample could be taken of the discharge. Mr. Cupo reported that they complied with Passaic Valley Sewerage Commission (PVSC) directions and that intended corrections to the boiler blowdown were planned for about July 15, 1974, when the plant was shut down for vacation (PAS-00102945).

According to the 1974 *PVSC Annual Report*, on July 2, 1974, Mr. Lubetkin wrote to Garfield confirming that their boiler blowdown was polluting, and directing them to make accessible the covered outlet. The available references did not specify the pollutants in the discharge. Mr. Lubetkin also informed them that they must have a NPDES permit from the USEPA in order to discharge into the Passaic River. Although no reply was received by PVSC, Inspector Cupo reported that he had questioned Mr. Bauer, a Vice-President, on July 22, and was told that the equipment delivery was causing the installation delay. He gave Inspector Cupo a copy of the report on a new Fulton Blowdown Separator, dated July 19, 1974, from the Fulton Boiler Works of Pulaski, New York (PAS-00102945)

According to the 1974 *PVSC Annual Report*, on August 24, 1974, Mr. Cupo inspected the work and reported that the boiler blowdown installation was completed and was now being discharged through a separator, into the sanitary sewer, thus eliminating this violation. Inspector Cupo also reported that the No. 3 outlet was now uncovered and it was sampled. Analysis showed that the discharge was satisfactory (PAS-00102945). According to an *Industrial Site Evaluation Element* dated June 1, 1989, in the past, stormwater, humidity room condensate, wastewater from slop sink, non-contact cooling water, boiler blowdown, and sanitary wastewater were all discharged to the Saddle River. Several unpermitted discharges and other violations of the NJPDES-discharge permit were noted to have occurred during the historical operations (PAS-00102947). Several deficiencies were noted at the Garfield Molding Company. These include: (PAS-00102948-9)

- Several unpermitted discharges and other violations of the existing NJPDES-discharge permit had occurred during the historical operations of the facility.
- It had been stated that past industrial practices at the facility included spreading waste oil on the unpaved driveways in an effort to control dust.
- Much of the machinery utilized on site was situated within concrete pits located inside the buildings. These pits were observed to contain lubricating oils. Drainage from these pits entered a concrete trough which ultimately emptied into a common concrete sump.
- Information addressing the plumbing/drainage system within the buildings was not provided.
- A suspected vent pipe was observed outside along Building 5 in the area of the cistern. It is unknown whether an additional UST was present in this area.
- A concrete trench was observed along the side of Building 5A. The trench was observed to be stained with an oily residue. This trench discharged to a catch basin located in the shipping/receiving area.

- Within a courtyard located between Building 14A and Building 1A, there was a pit covered with a steel plate and a discharge of a grayish dust which impacted the soils within the area.
- A catch basin was observed between Building 4A and Building 1A. This area had historically been used for drum storage.
- Overhead pipes were observed between Building 2 and Building 5B and also between Building 5B and Building 7. The insulation covering these pipes was deteriorated.
- Empty drums were stored outside of the former coal storage area (Building 11) and along the southwest corner of Building 16.
- The floor of Building 16 was heavily soiled. A portion of the roof was missing which had allowed rain water to reach the floor.
- A six-inch diameter pipe was observed along the south side of Building 7. This pipe apparently extended down to the water table.
- Two covered pits were observed in the area of the cistern; one located outside of the doors on the south side of the Building 5 and the other located immediately adjacent to the cistern.

Permits

In accordance with NJPDES Permit Number NJ0027146, Garfield Molding Company was permitted to discharge site stormwater runoff through outfalls 001, 002, 003, 004, 005, and 006 (PAS-00102808; PAS-00123371). The permit was effective from July 1, 1991 to August 31, 1992. Available references did not include permitted flow rates and effluent monitoring requirements or results.

Available references state that Garfield held Permit NJ0070211. This permit was for discharge of industrial site storm water runoff without toxic and hazardous pollutants to State surface waters, excluding those classified as FWI or located within the Pinelands Area, from facilities not requiring an individual NJPDES Permit, a DPCC/DCR plan, or treatment other than gravity separation, and in accordance with effluent limitations, monitoring requirements, and other conditions as set forth in Parts I, II, III, and IV of the permit (PAS-00102809). The permit was effective from September 1, 1987 to August 31, 1992. Available references did not include permitted flow rates and effluent monitoring requirements or results.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Data Presentation for Garfield Molding ECRA Case 88439*, prepared by EcolSciences, Inc., dated October 1990 (PAS-00102862).
- *Cleanup Plan for the Garfield Molding Company*, prepared by EcolSciences, Inc., dated October 1990 (PAS-00102926).

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

According to the 1990 Report, ten AECs were identified at the Garfield Molding Company. These AECs are (PAS-00102870-72):

- AEC 1 (Underground Storage Tanks (USTs))
- AEC 2 (Cistern)
- AEC 3 (Above Ground Vessels)
- AEC 4 (Former Drum Storage Areas)
- AEC 5 (New Jersey Pollutant Discharge Elimination System Discharge Points)
- AEC 6 (Unpaved Roadway Areas)
- AEC 7 (Groundwater)
- AEC 8 (Asbestos)
- AEC 9 (Former Production Wells)
- AEC 10 (Building Interiors)

Eight separate environmental sampling programs were designed and implemented to address the environmental concerns identified at the subject property. These sampling programs entailed the collection of 110 environmental samples for analyses of a combination of parameters including priority pollutants, petroleum hydrocarbons, and asbestos (PAS-00102873).

Remedial Activities

According to the 1990 Report, ten AECs were identified at the Garfield Molding Company (PAS-00102870). In addition, six USTs containing gasoline, fuel oil, light machine oils, waste oil and mineral spirits were previously found onsite. Following is a brief description of each AEC (PAS-00102871).

AEC 1 (USTs) – Following is an inventory of the USTs removed from the subject property listed by tank size, contents, age, and location relative to the onsite buildings:

USTs			
Tank Size	**Contents**	**Age**	**Location**
10,000 gallons	Fuel Oil	1957	East of Building 7A
275 gallons	Machine Oil	1908	East of Building 7A
275 gallons	Machine Oil	1908	East of Building 9A
275 gallons	Waste Oil	1985	South of Building 10
1,000 gallons	Gasoline	1975	East of Building 10
1,000 gallons	Mineral Spirits	1908	North of Building 6A

The 1,000-gallon mineral spirits tank was found to be leaking upon removal. All other tanks appeared to be intact (PAS-00102871).

AEC 2 (Cistern) – A brick-lined cistern was located onsite between Buildings 5 and 7. This cistern once contained non-contact cooling water for recirculation in thermal transfer molding process. Condensate from air compressors housed in Building 5A was also directed to the cistern (PAS-00102871).

AEC 3 (Above Ground Vessels) – Three cyclone dust collectors associated with product grinding and finishing operations were found to the east of Building 2. Normal operation of this dust collection system impacted the soils adjacent to the concrete pads supporting these towers. In addition to these cyclone dust collectors, two former coal gasification towers were once located adjacent to the south side of Building 5B; however, only remnant concrete pads were onsite. Former operations of a coal gasification plant raised several environmental concerns which were addressed through various onsite sampling programs (PAS-00102871).

AEC 4 (Former Drum Storage Areas) – Former drum storage areas were identified at the subject property. These drum storage areas consisted of drums stored in Building 16 and temporary drum storage areas at the southwest corner of Building 5A, at the northeast corner of Building 14A, and in the alleyway separating Buildings 1 and 3A (PAS-0010872).

AEC 5 (NJPDES Discharge Points) – Four surface water discharge points at the Garfield Molding Company were regulated under NJPDES permits. These discharge points received surface water runoff diverted from the subject property. NJPDES permitted discharge points posed an environmental concern, as this drainage network may have trapped contaminants associated with the surface areas of the subject property (PAS-0010872).

AEC 6 (Unpaved Roadway Areas) – An unpaved roadway traversed the eastern portion of the subject property, extending from the south side of Building 16, encircling Building 11 to the east, passing between Buildings 5B and 10, and finally ending at the east side of Building 6A. This roadway was an environmental concern as past maintenance practices included the spreading of motor oil across the roadway surface to control dust (PAS-00102872).

AEC 7 (Groundwater) – Groundwater contamination beneath the subject property is a potential environmental concern as the 1,000-gallon mineral spirits tank, at the north side of Building 6A was found to be leaking upon removal. Further, coal cinders found as fill material along the eastern-most perimeter of the site may have leached contaminants into the underlying groundwater (PAS-00102872).

AEC 10 (Building Interiors) – Floor space within several buildings showed oil staining attributed to manufacturing operations. The injection presses found in Building 1 were interconnected via a common oil lubrication system. Piping for this system was found in a network of concrete troughs beneath the production area floor. These oil lines and oil return sump lines were connected to a large central pump found in Building 5A, with the piping routed within a small tunnel connecting the two buildings. Portions of the concrete in Building 5 were oil stained as were major portions of the concrete trough network (PAS-00102872).

According to the 1990 Report, eight separate environmental sampling programs were designed and implemented to address the environmental concerns identified at the subject property. These sampling programs entailed the collection of 110 environmental samples for analyses of a combination of parameters including Priority Pollutants, petroleum hydrocarbons, and asbestos. The AEC sampling results are discussed below (PAS-00102873).

Post Tank Excavation Sampling Results – According to the 1990 Report, post tank excavation sampling entailed the collection of soil samples beneath the six USTs removed from the subject property during June 1990. Additional samples were also taken to screen an area suspected of once containing an underground tank, although no evidence of a former tank was found (PAS-00102878).

Overall, five of six USTs removed from the subject property visually appeared to be intact. Post tank excavation soil sampling results revealed elevated concentrations of PAHs and PCBs (one Aroclor-1260 detection) detected in soils beneath the 275-gallon waste oil tank. Potentially contaminated soil beneath the tank was excavated to the point of contact with the underlying water table and temporarily staged onsite prior to disposal (PAS-0010883). Soil samples collected from beneath the 275-gallon tank showed concentrations of the PAHs phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, ranging from 1400 µg/kg (benzo(k)fluoranthene in sample T-W-5) to 7100 µg/kg (pyrene in sample T-W-5). In addition, the PCB Aroclor-1260 was detected at 1,400 µg/kg (PAS-00102882).

Aboveground Vessel Sampling Results – According to the 1990 Report, the collection of soil samples surrounding the cyclone dust collectors showed that these soils contained elevated concentrations of phenanthrene 550 µg/kg in sample V1-S2 at a depth of 0-6 inches to (640 µg/kg in sample V1-S3 at a depth of 0-6 inches) and copper at a concentration of 586 mg/kg in sample V1-S3 at a depth of 0-6 inches to 1,800 mg/kg in sample V1-S1 at a depth of 0-6 inches. Post excavation samples collected upon the removal of potentially contaminated soils surrounding the dust collectors showed concentrations of copper (704 mg/kg in sample VE-3 at a depth of 24-30 inches to 2,585 mg/kg in sample VE-1 at a concentration of 24-30 inches), lead (558 mg/kg in sample VE-6 at a depth of 24-30 inches to 738 mg/kg in sample VE-3 at a depth of 24-30 inches), and mercury (1.0 mg/kg in sample VE-6 at a depth of 24-30 inches to 2.5 mg/kg in sample VE-3 at a depth of 24-30 inches) were detected in the post excavation soil samples. These elevated metal concentrations were likely attributed to the presence of coal cinders and coal fragments in the soil base supporting the dust collection towers. Upon removal of the upper 2 feet of soils beneath the dust collectors, the underlying material was found to consist primarily of coal cinders (PAS-00102887-89).

Soil samples were collected adjacent to the former coal gasification tower pads. The initial sampling results showed that these soils contained fluoranthene (3,000 µg/kg in sample V2-S3 at a depth of 24-30 inches) and pyrene (2,800 µg/kg in sample V2-S3 at a depth of 24-30 inches). Post excavation samples collected upon the removal of potentially contaminated soils surrounding the concrete pads showed slightly elevated concentrations of mercury (2.5 mg/kg). Again, as in the area surrounding the dust

collectors, soils beneath the former coal gasification tower pads contained varying amounts of coal cinders and coal fragments (PAS-00102887-89).

Approximately 90 tons of potentially contaminated soils were removed beneath the dust collectors and 30 tons of potentially contaminated soils were removed at the location of the former coal gasification tower pads. Soils at both locations were excavated to a depth of 2 feet below grade. Upon excavation, the underlying soil material was determined to consist primarily of coal cinders. Post excavation sampling results reflect the composition of these cinder deposits, with elevated concentrations of metals detected in the samples. Additional remediation was not proposed with respect to the soils beneath either the dust collectors or former coal gasification tower pads. Rather, the coal cinder deposits encountered at these locations were covered with a layer of certified clean fill material to minimize erosion and potential exposure to the underlying cinder-laden soil (PAS-00102919).

Former Drum Storage Area Sampling Results – Sampling at the former drum storage areas entailed the collection of shallow surface soils at three temporary drum storage areas having permeable surfaces to determine if leakage or spillage from drums resulted in residual contamination of the underlying soils (PAS-00102890).

Additional soil remediation was proposed for these areas, with each excavation to encompass a 20 by 20 foot area. Approximately 200 tons of potentially contaminated soils were expected to be staged for disposal (PAS-00102919).

Drum Storage Area D3 (East of Building 1) – Soil samples collected from this former drum storage area contained the PAHs phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(a) pyrene at concentrations ranging from 2,100 to 12,000 µg/kg (PAS-00102890; PAS-00102892).

Drum Storage Area D4 (North of Building 14A) – Soil samples collected from this former drum storage area contained the PAHs phenanthrene, fluoranthene, pyrene, benzo(b)fluoranthene and benzo(a) pyrene at concentrations ranging from 820 to 14,000 µg/kg (PAS-00102894; PAS-00102892).

Catch Basin Sampling Results – Twelve surface water inlets are connected to the four NPDES-permitted discharge points on the Garfield Molding Company property. Eight catch basins were sampled at those locations where these surface water Inlets function as receiving points for site runoff or potential spills. Once sampling was completed, all surface water inlets were cleared of sediment deposits and steam cleaned (PAS-00102894).

PAHs were detected in five of eight catch basin sediment samples. Maximum concentrations were as follows:

PAHs in Catch Basins		
Constituent	**Concentration (µg/kg)**	**Location**
Dibenzofuran	7,100	CB-3
Naphthalene	5,600	CB-3
Acenaphthene	7,900	CB-3
Fluorene	9,000	CB-3
Phenanthrene	19,000	CB-3
Anthracene	9,700	CB-3
Fluoranthene	17,000	CB-3
Pyrene	17,000	CB-3
Benzo(a)anthracene	19,000	CB-3
Benzo(b)fluoranthene	34,000	CB-3
Benzo(k)fluoranthene	12,000	CB-3
Benzo(a)pyrene	27,000	CB-3
Chrysene	26,000	CB-3
Indeno(1,2,3-cd)pyrene	17,000	CB-3
Dibenz(a,h)anthracene	4,500	CB-3

(PAS-00120897)

Unpaved Roadway Sampling Results – Unpaved roadway sampling entailed the collection of shallow soil samples from beneath the gravel roadway traversing the eastern portion of the subject property. The gravel roadway extends from the south side of Building 16, encircles Building 11 to the east, passes between Buildings 5B and 10, then follows the eastern boundary of the property to the end of the roadway at the east side of Building 6A. Sampling of this roadway corridor was undertaken to address potential environmental concerns arising from past practices of spreading oil on the roadbed to control dust (PAS-00102895). PAHs were detected at low concentrations. No PCBs were found in the roadway samples (PAS-00102899).

Groundwater Sampling Results – Four overburden monitoring wells were installed at the Garfield Molding Company property on August 9 to 13, 1990, as part of an initial hydrogeological assessment of the subject property (PAS-00102902).

The initial groundwater sampling results showed that leakage from the former 1,000-gallon mineral spirits tank had impacted the adjacent groundwater. PAHs were found at concentrations ranging from 29 to 430 micrograms per liter (µg/L). Only trace concentrations of metals were detected in groundwater (PAS-00102913).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Diamond Alkali OU2 Allocation

ADR Confidential

Facility Data Report

GENERAL ELECTRIC COMPANY

Facility Name, Address and Size: General Electric Company and RCA; 1000 South 2nd Street, Harrison, New Jersey (known as 2nd Street Facility or Building No. 55); approximately 2.66 acres (PAP-00075203; PAP-00341690); 450 employees, 1 shift per day, 5 days per week (PAP-00075203).

1. **Business Type:** Manufacturing of vacuum tubes (PAP-00342923; PAP-00340701-02)

2. **Time Period of Ownership/Operations**

   Operator: 1950 to 1975
   Owner: 1950 to 1976

1940s: Otis Elevator Company owned the property prior to World War II, and deeded the property to the Defense Plant Corporation during the early 1940s (PAP-00075178).

1943: Defense Plant Corporation constructs Building No. 55 on the property (PAP-00341711).

1945: The 2nd Street Facility sold to Zauzner Cheese Corp. (PAP-00075178).

1950: RCA purchased the 2nd Street Facility from Zauzner Cheese Corp. (PAP-00075179, PAP-00341711; PAP-00343578).

1975: RCA ceased operations at the 2nd Street Facility on December 31, 1975 and the property was vacant until it was sold in 1976 (PAP-00341690).

1976: RCA sold the 2nd Street Facility to International Fastener Research Corporation in June 1976 (PAP-00343486). In November 1976, the David Weist Auctioneer Company held a 12-day public auction to liquidate all of the RCA machinery, equipment, instruments, and supplies at Harrison (PAP-00074229).

1986: GE acquired RCA (PAS-00122713, 843). GE combined the consumer electronic operations of both RCA and GE into what was known as the GE Consumer Electronics Business (PAS-00122776-77).

1987: GE sold the GE Consumer Electronics Business to Thomson S.A. on December 31, 1987 (PAS-00122777, 837, 843).

3. **Operational History/COC Use and Presence at the Facility**

   There is a single 147,000-square-foot building, located adjacent to the Pennsylvania Path Railroad. The building was constructed by Defense Plant Corporation, for manufacturing heavy equipment, such as the Sherman Tank (PAP-00075178; PAP-00343741). The building, Building No. 55, was constructed in 1943 and acquired by

RCA in 1950 (PAP-00341711). Building No. 55 has two floors and is constructed of brick walls, steel frame, and concrete floors (PAP-00341710).

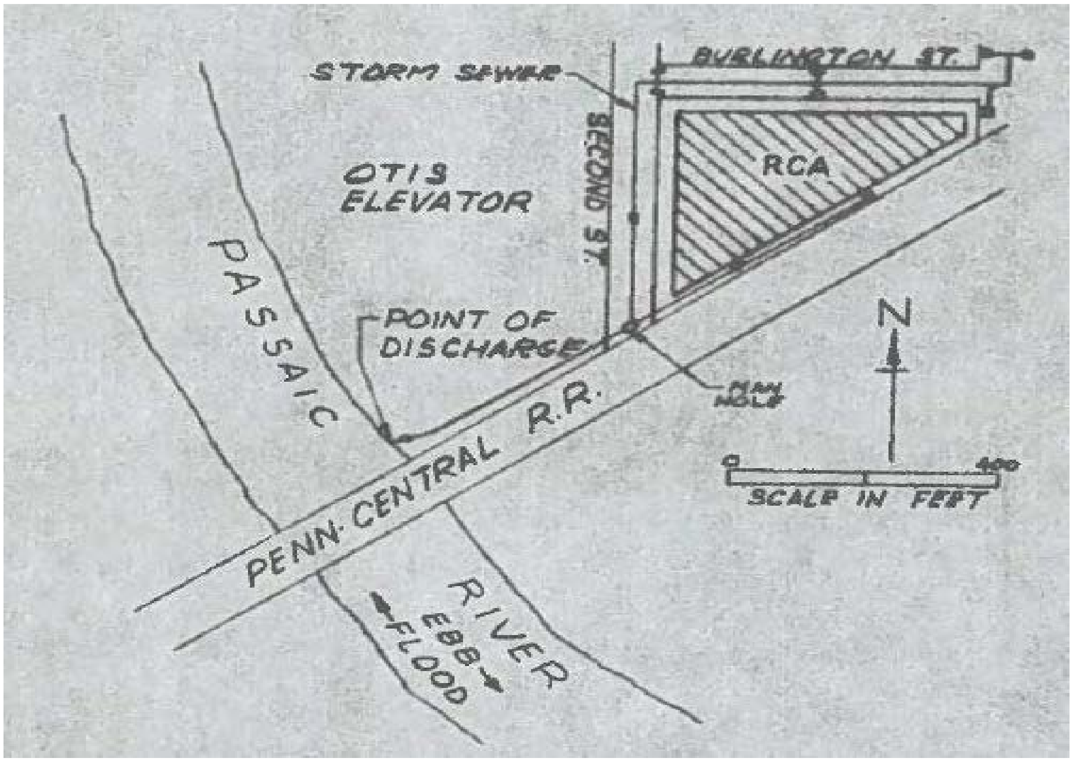
Operations included production of receiving tubes, photo tubes, power tubes, and other products (PAP-00075179). Raw materials used in tube manufacturing included nigrosine, porcelain, petroleum jelly, zinc, calcium aluminum fluoride, resin, ethyl alcohol, lead acetate, malachite green, glycerine, zinc chloride, iron, marble dust, wood fiber, strontium nitrate, lead oxide, zinc oxide, mica, tin, sodium carbonate, sodium nitrate, silver oxide, barium carbonate, isolantite, molybdenum, alumina, borax, barium, copper, carbon, chromium, calcium, cesium, cobalt, iridium, monel, mercury, calcium oxide, barium nitrate, calcium carbonate, ammonium chloride, potassium carbonate, bakelite, phosphorus, silicon, shellac, tungsten, titanium, silica, glass, magnesia, platinum, strontium, magnesium, rosin, nickel, cobalt oxide, and thorium nitrate. (PAP-00074226; PAP-00074217-23). Equipment used included grid winders, cathode sprayers, test consoles, glass sealing machines, spot welders and tube aging racks (PAP-00074229).

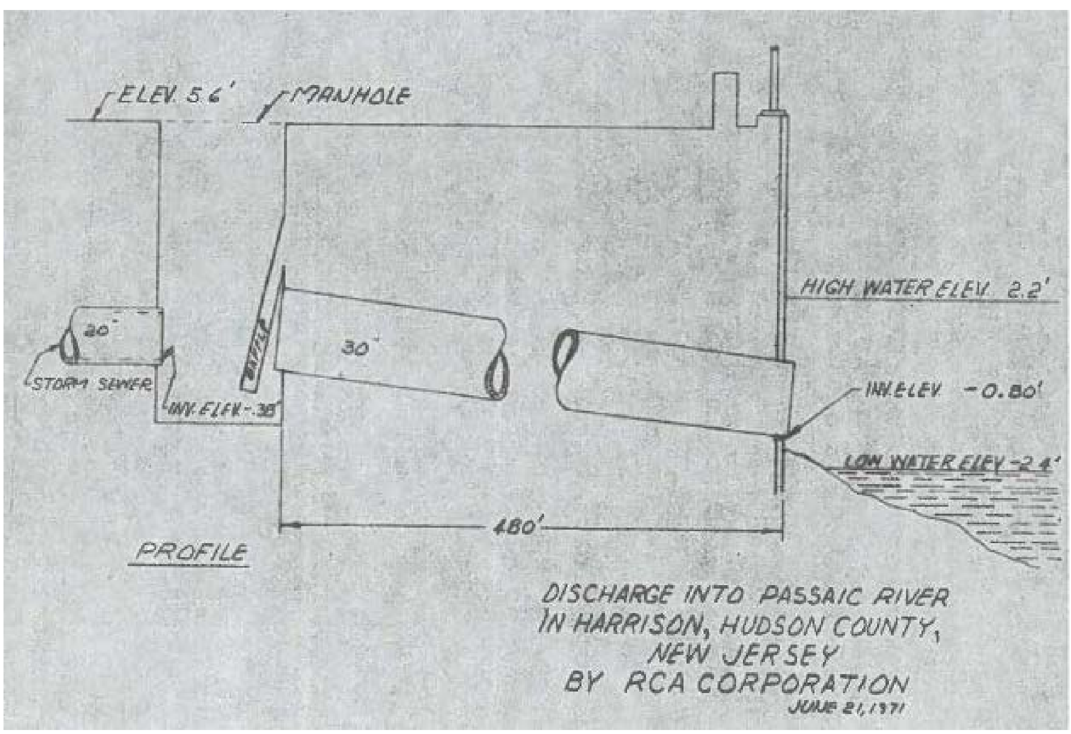
Materials containing copper, lead and mercury were used in vacuum tube production (PAP-00074226). Exterior parapet lighting was self-ballasted mercury vapor (PAP-00075183).

Former employees testified in a litigation relating to an insurance coverage dispute that process wastes were not disposed down floor drains, but instead would be poured into a special container and hauled off-site for disposal (PAP-00341794).

The large plating room had a cyanide collection tank. Separate acid drains passed into neutralizing tanks and then passed into the sanitary sewer system which discharged to the Passaic Valley Sewerage Commissioners (PVSC) system. Cooling water entered a drain piping system in the overhead utility distribution rack and joined with roof drains, cooling tower discharge, and various sprinkler and street drains, to the combined storm sewer drain system that passes through the adjacent Otis Elevator property and into the Passaic River (PAP-00075182).

A drawing of the discharge point, as well as a profile drawing of the discharge point, are presented below (PAP-00074199):


STORM SEWER
BURLINGTON ST.
SECOND ST.
OTIS ELEVATOR
RCA
PASSAIC
POINT OF DISCHARGE
PENN CENTRAL R.R.
N
0
400
SCALE IN FEET
RIVER
EBB
FLOOD


ELEV. 5.6'
MANHOLE
HIGH WATER ELEV. 2.2'
20"
30"
STORM SEWER
INV. ELEV. -.38
INV. ELEV. -0.80'
LOW WATER ELEV. -2.4'
480'
PROFILE
DISCHARGE INTO PASSAIC RIVER
IN HARRISON, HUDSON COUNTY,
NEW JERSEY
BY RCA CORPORATION
JUNE 21, 1971

4. Identified COCs

- PCBs
- Copper (use)
- Lead (use)
- Mercury (use)

Detections of COCs in environmental samples are not reported in the available references. No sampling data for the 2nd Street Facility was located in the available file materials. The majority of the historic information and investigations in the file materials focused on the main plant, located on South 5th Street, which is addressed in a separate Data Report.

PCBs

According to an *RCA Plant Facilities Survey*, dated December 31, 1975, the main service transformers were owned by RCA (PAP-00341691). A summary table of PCB sales for Harrison New Jersey states that RCA purchased 1,850 pounds of Aroclor 1254 between 1958 and 1963, but the table does not specify which RCA facility made this purchase (PAP-00342156).

Copper

No information regarding the volumes of copper used and/or stored at the 2nd Street Facility was identified in the available file materials.

Lead

No information regarding the volumes of lead used and/or stored at the 2nd Street Facility was identified in the available file materials.

Mercury

No information regarding where mercury was used and/or stored at the 2nd Street Facility was identified in the available file materials.

Historic Fill

The Allocation Team has determined that the 2nd Street Facility is located entirely on regional Historic Fill as designated by the NJDEP.[1]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

There is no information regarding sampling results in the available file material.

5. COC Pathways

The 2nd Street Facility is located approximately 500 feet from the Passaic River (PAS-00048608). The entire property is covered by the single building present, Building No. 55 (PAP-00341690).

Sanitary and Storm Sewer

Effluent from the 2nd Street Facility passed into neutralizing tanks and then into the sanitary sewer system which discharged into the PVSC system. The 2nd Street Facility is not located within the Bergen Street combined sewer outfall (CSO) district. Effluent from the 2nd Street Facility discharged into a 10-inch sewer line that emptied directly into the PVSC trunk line at the intersection of Middlesex Street and 2nd Street, which then transported the effluent to the PVSC treatment works (PAP-00075182).

Process equipment cooling water, water from roof drains, cooling tower discharge, blowdown, and various sprinkler and street drains discharged to a storm sewer drain system that passed through the adjacent Otis Elevator property and discharged into the Passaic River (PAP-00075182). Application Number 000051 to the Army Corps of Engineers covered this discharge (PAP-00075182).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

Documented wastewater discharge volumes are as follows:

- According to a *PVSC Waste Effluent Survey*, dated May 22, 1972, the 2nd Street Facility, in 1971, discharged 32,250,000 gallons of waste water to the sanitary sewer (PAP-00075204). The waste effluent sampling results for this discharge contained 97 μg/L copper (PAP-00075207; PAS-00124484). Lead was <10 μg/L (PAP-00075207; PAS-00124484).

- According to a *PVSC Waste Effluent Survey*, dated May 22, 1972, the 2nd Street Facility, in 1971, 12,900,000 gallons of water were discharged to the "Storm Sewer, River, or Ditch" (PAP-00075204). This effluent consisted of cooling water with 75 percent of the volume consisting of untreated city water and the remaining 25 percent of the volume being from the air conditioning cooling towers. The cooling water contained no metals (PAS-00048608). The discharge point is located just north of the Penn-Central Railroad Bridge, on the adjacent Otis Elevator property (PAP-00075204).

- According to an *RCA Plant Facilities Survey*, dated December 31, 1975, there was no liquid waste including, sanitary, industrial, cooling water, and other (PAP-00341693).

Direct Release

Process equipment cooling water, water from roof drains, cooling tower discharge, blowdown, and various sprinkler and street drains discharged to a storm sewer drain system that passed through the adjacent Otis Elevator property and discharged into the Passaic River (PAP-00075182). Application Number 000051 to the Army Corps of Engineers covered this discharge (PAP-00075182). No additional information on direct releases to the Passaic River was identified in the available file materials.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

Application Number 000051 to the Army Corps of Engineers covered the discharge of process equipment cooling water, water from roof drains, cooling tower discharge, blowdown and various sprinkler and street drains discharged to a storm sewer drain system that passed through the adjacent property and discharged into the Passaic River (PAP-00075182).

According to a letter to EPA dated April 9, 1980, RCA submitted a signed Affidavit of Exemption from NPDES No. NJ0000230 for the Harrison Plant (PAP-00343675). However, no location information was provided in this letter, so it is not clear which property the exemption pertains to. No other permit information specific to the 2nd Street Facility was identified in the available file materials.

7. Response Actions

Characterization Activities

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

There is no information regarding soil sampling in the available file material.

Remedial Activities

There is no information regarding remedial actions in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

GENERAL ELECTRIC COMPANY

Facility Name, Address and Size: General Electric Company and Radio Corporation of America (RCA); 415 South 5th Street, Harrison, New Jersey (known as the 5th Street Facility or Main Plant); also identified as 400 South 5th Street (PAP-00074230; PAS-00122713); approximately 12.75 acres (PAP-00341685); other addresses used for this facility include 420 South 5th Street for Building C, 530 Bergen Street for Building B, and 400 South 5th Street for Building A (PAS-00049080; PAP-00074238); up to 20,000 workers with round the clock shifts 7 days per week during World War II (PAP-00074228); 2,900 employees, 2 shifts per day, 5 days per week in 1972 (PAS-00122720); reduced to 1,300 employees, 1 shift per day, 5 days per week in 1975 (PAS-00122728).

1. **Business Type:** Manufacturing of incandescent lamps and vacuum tubes (PAP-00075192, PAP-00075193, PAP-00075193)

2. **Time Period of Ownership/Operations**

   Operator: 1882 to 1976
   Owner: 1882 to 1976

The *Remedial Action Work Plan*, dated July 15, 2015 (2015 RAWP), the *Onsite Remedial Investigation Report*, dated January 28, 2015 (2015 RI Report), and an undated *Archive of Industry for Harrison, NJ* provided a corporate history of the site as follows. Any discrepancies in the dates as noted in other sources are identified.

1877: The property was developed by Peters Manufacturing Company (PAP-00074237; PAP-00074666).

1882: The Edison Lamp Company acquired the property to manufacture incandescent lamps (PAP-00074237; PAP-00074666; PAP-00075192). It is noted that a Building Assessment Summary Report, dated January 2019 (2019 Building Assessment), stated that The Edison Lamp Company acquired the property in May 1881 (PAP-00342922).

1889: The Edison Lamp Company was consolidated into the Edison General Electric Company (PAP-00074237; PAP-00074666). The undated Archive of Industry for Harrison, NJ stated that this occurred in 1885 (PAP-00075192).

1892: The Edison General Electric Company and the Thompson-Houston Electric Company were consolidated to create General Electric Company (GE) (PAP-00074237; PAP-00074666). GE owned/operated the 5th Street Facility until 1929 (PAP-00074237).

1919: According to a Media Profile Chronology, RCA was incorporated in 1919 (PAS-00122833).

1930: RCA purchased the 5th Street Facility from GE to manufacture radio vacuum tubes (PAP-00074237; PAP-00075193). According to the 2019 Building Assessment, RCA purchased the 5th Street Facility in 1927 (PAP-00342923).

1932: Based on an online article, RCA was spun off as an independent corporation in 1932 (PAS-00122713, 834).

1943: According to the 2006 Extraction Form, RCA had operated at the 5th Street Facility on or before August 27, 1943 (PAS-00122713).

1976: According to a letter from RCA to the Passaic Valley Sewerage Commissioners (PVSC), dated March 9, 1977, RCA phased out operations at the Harrison facility in June 1976 (PAS-00122770). RCA sold the 5th Street Facility to International Fastener Research Corporation on June 17, 1976 (PAP-00074238; PAP-00343542). The article titled "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 stated that the David Weisz Auctioneer Company held a 12-day public auction in November 1976 to liquidate all of the RCA machinery, equipment, instruments, and supplies from the Harrison Plant (PAP-00074229).

1977: International Fastener Research Corporation sold the 5th Street Facility to Vo-Toys, a subsidiary of VIP Realty Associates (PAP-00074238). VIP Realty Associates leased portions of the 5th Street Facility to various tenants over time (PAP-00074237).

1986: The 2006 Extraction Form stated GE acquired RCA in mid-1986 (PAP-00342923; PAS-00122713, 843). A letter from Thomson Consumer Electronics to EPA, dated February 21, 1997, stated that GE combined the consumer electronic operations of both RCA and GE into what was known as the GE Consumer Electronics Business (PAS-00122776-77).

1987: The February 21, 1997 letter from Thomson Consumer Electronics to EPA stated that GE sold the GE Consumer Electronics Business to Thomson S.A. on December 31, 1987 (PAS-00122777).

1990: VIP Realty Associates acquired the 5th Street Facility from Vo-Toys on December 17, 1990 (PAP-00074238; PAP-00074666). Vo-Toys used the 5th Street Facility for warehousing and distribution until May 2015, according to a *Mercury Data Summary Report*, *Vo-Toys Site*, dated October 2016 (2016 Mercury Report) (PAP-00074842).

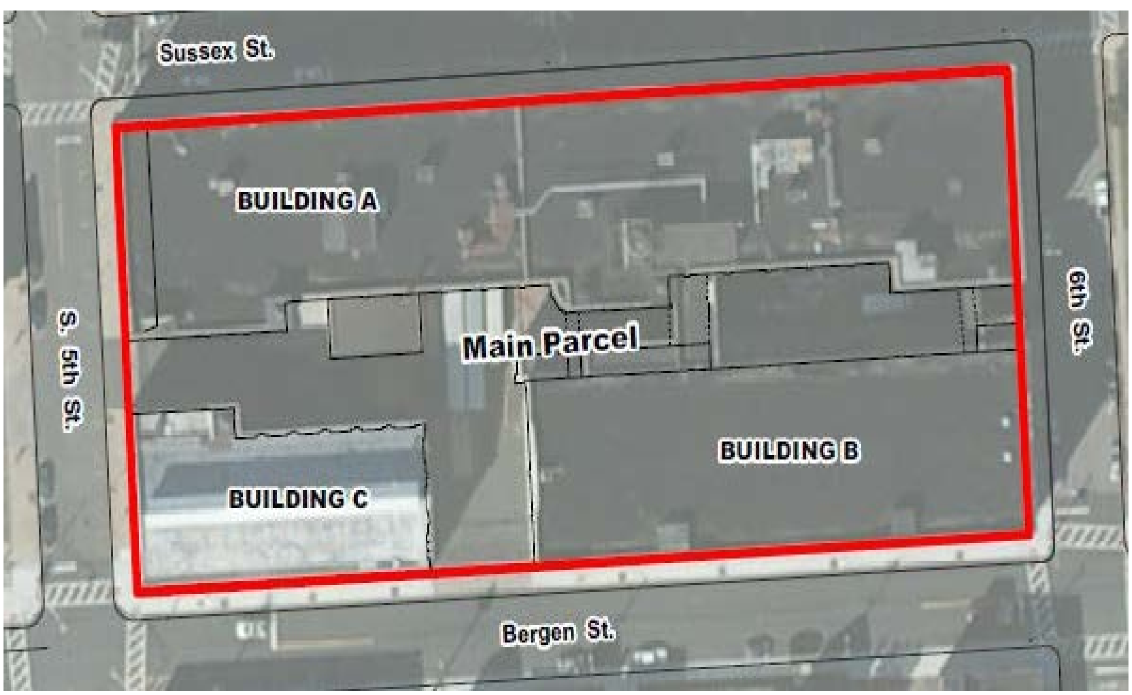
2015: According to the 2016 Mercury Report, VIP Realty Associates sold the 5th Street Facility to BRG Harrison Lofts Urban Renewal, LLC (BRG) in May 2015 (PAP-00074842). The First Amended Complaint brought by BRG against GE, filed November 17, 2016, stated that BRG acquired the 5th Street Facility on June 9, 2015 (PAS-00049079). BRG is still the current owner of the 5th Street Facility as of January 2019 (PAP-00342919).

3. Operational History/COC Use and Presence at the Facility

As discussed in the 2015 RAWP, the 5th Street Facility was developed in the early 1900s with three multi-story industrial buildings designated as Buildings A, B, and C, which covered a total area of approximately 68,000 square feet. Buildings A and B were connected by two enclosed, elevated walkways. The parking lot is approximately 0.46 acres and paved with asphalt (PAP-00074238).

According to the 2019 Building Assessment, Building A was also known as Building No. 36/37, Building B was also known as Building No. 33, and Building C was also known as Building No. 34 (PAP-00342921). A *RCA Plant Facilities Survey*, dated December 31, 1975, documented the total areas of the buildings as follows: Building A was a three story slab on grade building with an interior area of approximately 109,500 square feet. Building B was a three story slab on grade building with an interior area of approximately 60,700 square feet. Building C had a basement and two floors, with an interior area of approximately 30,700 square feet (PAP-00341704-07). The 2019 Building Assessment and the 1975 Plant Facilities Survey stated Building A was constructed in 1913 and 1914, Building B was constructed in 1907, and Building C was constructed in 1902 (PAP-00341705, 07; PAP-00342921).

A figure of the 5th Street Facility buildings from the 2015 RAWP is presented below (PAP-00074296):



According to the undated Archive of Industry for Harrison, NJ, operations at the Harrison plant consisted of incandescent lamp manufacturing from 1882 until approximately 1929 (PAP-00075192-93). During this time, the raw materials used in incandescent lamp manufacturing included lead glass, wood, plaster, metals, cotton, zinc chloride, alcohol, and filaments made of cellulose, tantalum, and tungsten (PAP-00075192; PAP-00075196-98). Lamp making was largely done by hand until mechanization in 1895 (PAP-00075200).

According to an article titled "*History Corner, A Short History: The Role of Mercury in Vacuum and PVD Technology*," by Donald M. Mattox in a 2016 SVC Bulletin publication, Thomas Edison patented an all-mercury combination vacuum pump in 1881 that used banks of pumps in parallel to evacuate incandescent lamps, and these pumps were used by Edison up to 1896. This pump type required continuous cleaning, maintenance, repair, and replacement (PAP-00341717).

In 1930, RCA purchased the 5th Street facility to make vacuum tubes, according to the 2015 RAWP and 2015 RI Report (PAP-00074237; PAP-00075193). An article titled "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 stated that sixty-five various types of metal, chemical compounds and gases were used to manufacture these tubes, including mercury, copper, lead acetate, and lead oxide . During World War II, RCA developed tubes for communications, radar, sonar and related defense electronics at the 5th Street Facility (PAP-00074226-28). According to a United States Navy Security Report, dated February 26, 1942, the 5th Street Facility was producing glass and metal radio receiving and power tubes, phototubes, gas triodes and tetrodes, cathode-ray and television tubes, voltage regulation tubes, acorn tubes and special amplifier tubes (PAP-00074212). The article titled "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 identified equipment used as including grid winders, cathode sprayers, test consoles, glass sealing machines, spot welders and tube aging racks (PAP-00074229).

Former employees testified in a litigation relating to an insurance coverage dispute that solvent wastes were not disposed down floor drains, but instead were poured into containers and hauled off-site for disposal (PAP-00341796-98).

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (used, detected)

PCBs

PCBs were not noted to be used in manufacturing either incandescent lamps or vacuum tubes. According to the 2015 RI Report, historical records stated that a transformer substation was located adjacent to the western side of Building No. 33 (also known as Building B) (PAP-00074681), and PCBs appeared to have been used in the transformer substation in 1958, 1959 and 1963 (PAP-00074681). According to the *RCA Plant*

Facilities Survey, dated December 31, 1975, the main service transformers were owned by RCA (PAP-00341686). A Sales Summary Analysis table of PCB sales for Harrison, New Jersey stated that RCA purchased 1,850 pounds of Aroclor 1254 between 1958 and 1963 (PAP-00342156; PAP-00304327-33).

Soil and building material samples were collected in 2014 and reported in the 2015 RAWP and 2015 RI Report. PCBs were detected in shallow soil adjacent to a transformer substation and in concrete and wood floor material in Building B. An area of approximately 750 square feet of PCB-impacted soil was identified between 0.5 feet below ground surface (bgs) to 4.5 feet bgs at the former transformer substation (PAP-00074246; PAP-00074682). Concentrations ranged from non-detect to 2.12 milligrams per kilogram (mg/kg) (PAP-00074308).

Floor scape samples from Building B and samples of wood and concrete debris were analyzed for PCBs and concentrations ranged from 0.8 to 736 mg/kg, but PCBs were not detected in soil samples beneath the building floors (PAP-00074247; PAP-00074684).

PAHs

According to the 2015 RAWP and 2015 RI Report, PAH-impacted soil was encountered to a depth of approximately 3 feet bgs in a small area stained with hydraulic oil at Building B (PAP-00074249). Concentrations were as high as 380 mg/kg for benzo(a)anthracene, 290 mg/kg for benzo(a)pyrene, 360 mg/kg for benzo(b)fluoranthene, 54 mg/kg for dibenzo(a,h)anthracene, and 150 mg/kg for indeno(1,2,3-cd)pyrene (PAP-00074732).

Six of the seven concrete filled pits in the western concrete floor area of Building B were analyzed for PAHs and all six had detections of PAHs (PAP-00074797). Sampling determined that approximately one-third of the slab in Building B was impacted with PAHs. Redevelopment is anticipated to require removal of the first floor of Building B as well as the underlying soils to a depth of 3 feet below the top of the existing floors (PAP-00074688). Concentrations were as high as 11 mg/kg for benzo(a)anthracene, 7.8 mg/kg for benzo(a)pyrene, 15 mg/kg for benzo(b)fluoranthene, 2.0 mg/kg for dibenzo(a,h)anthracene, and 7.7 mg/kg for indeno(1,2,3-cd)pyrene (PAP-00074726, 797).

Copper

It is possible that copper was used as a raw material in the manufacture of incandescent lamps. Early production of lamps involved a copper plated wire connected to the filament (PAP-00342147).

Copper was used in the manufacture of RCA radio tubes, as listed in the article "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 (PAP-00074226). A RCA Standardization Notice 34-36-5A, dated September 9, 1941, reported the use of DuPont's high speed copper solution in copper plating operations (PAP-00075219). Another Standardization Notice 34-36-7D, dated April 14,

1942, was for silver plating of copper radiator fin spacers for power tubes (PAP-00075213). In addition, the United States Navy Security Report, dated February 26, 1942, identified copper sulfate, copper flashed steel wire, and copper wire as used at the facility (PAP-00074217, 20-21). No information regarding the volumes of copper used at the 5th Street Facility was identified in the available file materials.

The 2015 RI Report included metals results for soil and building material samples at AOC-A and AOC-L. Copper was reported at a maximum concentration of 100 mg/kg in soil samples collected at AOC-A. The maximum concentration of copper in wood and concrete pit samples collected from Building B at AOC-L was 3,400 mg/kg, while soil samples contained up to 200 mg/kg copper (PAP-00074775, 97).

Lead

The publication titled "A Century of Light" dated 1979 stated leaded glass was used in incandescent lamp manufacturing until 1914, when lime glass was developed for machine production (PAP-00075192). Raw materials containing lead were used in vacuum tube production, according to the article "*RCA Tube Production, Harrison, New Jersey, 1930-1976*" in the Vacuum Tube Valley Issue 8 from 1997 (PAP-00074226). No information regarding the volumes of lead used at the 5th Street Facility was identified in the available file materials.

According to the 2015 RI Report, lead was detected at AOC-L in soil beneath the eastern wood floor area of Building B, as well as in the soil beneath the seven concrete filled pits in the western concrete floor area of Building B, with a maximum concentration of 130 mg/kg (PAP-00074683, 770). Lead at the seven concrete filled pits was detected as high has 2,500 mg/kg (PAP-00074726, 95).

Lead was also detected in soil at the former UST areas, including AOC-A (Former 550 Gallon Unknown Oil UST), at a maximum concentration of 37 mg/kg, and AOC-E2 (Historical Gasoline ASTs [Aboveground Storage Tanks]) at a maximum concentration of 76 mg/kg (PAP-00074770, 90).

Mercury

Mercury was not noted to be used as a raw material in incandescent lamp manufacturing at the 5th Street Facility, according to the undated Archive of Industry for Harrison, NJ and a publication titled "A Century of Light" dated 1979 (PAP-00075192; PAP-00075196-98), but an article titled "*History Corner, A Short History: The Role of Mercury in Vacuum and PVD Technology*," by Donald M. Mattox in a 2016 SVC Bulletin publication stated that mercury pumps may have been used to create a vacuum in lamp bulbs during incandescent lamp production until 1896 (PAP-00341717).

The manufacturing of vacuum tubes by RCA was reported to include mercury (PAP-00074226). Mercury was identified as a raw material in the manufacturing of radio vacuum tubes at the 5th Street Facility in a United States Navy Security Report, dated February 26, 1942 (PAP-00074211, 20). In addition, RCA Radiotron Company, Inc. issued a Standardization Notice No. 34-8-1, dated June 19, 1942, to standardize the

process of reclaiming mercury that had been used at the laboratories and factories (PAP-00075216-18).

The 2015 RI Report identified two Areas of Concern (AOCs) at which mercury was detected: AOC-A (Former 550 Gallon UST) and AOC-L (Sumps and Pits) (PAP-00074677, 83). At AOC-A, it was determined that an area of soil approximately 200 square feet extending to an approximate depth of 6.0 feet bgs was impacted by mercury in the vicinity of the former 550-gallon unknown petroleum hydrocarbon underground storage tank (UST) (PAP-00074677-78). According to the 2015 RAWP, concentrations in soil ranged from non-detect to 3.4 mg/kg (PAP-00074305-07).

At AOC-L, concrete slab samples were collected from seven concrete filled pits based on field observation, and soil samples were collected directly beneath the wood floor as well as beneath the concrete pits in Building B. Mercury was detected in soil beneath the eastern wood floor area of Building B, as well as in the soil beneath the seven concrete filled pits in the western concrete floor area of Building B up to 26 mg/kg (PAP-00074683, 798). Mercury at the wood area and seven concrete filled pits was as high as 650 mg/kg (PAP-00074726, 95).

According to the 2016 Mercury Report, the maximum mercury concentration in soil at Building A was 7.3 mg/kg within an elevator pit at a depth of 5.5 feet bgs. The maximum mercury concentration in soil at Building B was 75 mg/kg at a depth of 4.2 feet bgs. The maximum mercury concentration in soil at Building C was 56 mg/kg within an elevator pit at a depth of 11.5 feet bgs (PAP-00074857-58).

As discussed in the 2016 Mercury Report, elevated concentrations of mercury vapors were identified during the 2013 Preliminary Assessment in two areas on the third floor of Building C (PAP-00074842). Mercury vapor was detected at a concentration of 0.370 micrograms per cubic meter (ug/m^3) (PAP-00074849). Additional mercury vapor investigations in October 2015 and January 2016 determined that concentrations of mercury vapors were higher than the 2013 concentrations and mercury vapors were detected on all three floors in all three buildings (PAP-00074843). The maximum vapor concentrations were as follows:

- Building A: October 2015 maximum reading of 10.39 ug/m^3 on the second floor, at floor level (six inches above the floor). January 2016 maximum reading of 5.06 ug/m^3 on the first floor at floor level.
- Building B: October 2015 maximum reading of 274 ug/m^3 on the first floor at the breathing zone (5 feet above the floor). January 2016 maximum reading of 25.26 ug/m^3 on the first floor at floor level.
- Building C: October 2015 maximum reading of 34.546 ug/m^3 on the first floor at the breathing zone. January 2016 maximum reading of 34.128 ug/m^3 on the first floor at floor level (PAP-00074850-51).

As noted in the 2016 Mercury Report, elemental mercury beads were found in two locations within the subfloor of the first floor of Building B. One area contained one mercury bead, and the other area contained elemental mercury beads over an area of approximately 40 feet by 10 feet (PAP-00074859).

Historic Fill

The Allocation Team has determined that the 5th Street Facility is not located on regional Historic Fill as designated by the NJDEP.[1]

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

According to cross-sections included in the 2015 RI Report, fill is present and ranges in thickness from approximately 8 feet to 20 feet (PAP-00074707-11). However, this fill is not identified as Historic Fill.

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 (NJDEP map identifying locations of recognized historic fill).

[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Oher Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

[4] NJDEP Table 4-2 (PAHS & lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils from the 2015 RI Report are presented in the table below (PAP-00074732, 95).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	2,500 mg/kg
Copper	3,400 mg/kg
Mercury	650 mg/kg
Benzo(a)anthracene	380 mg/kg
Benzo(a)pyrene	290 mg/kg
Benzo(b)fluoranthene	360 mg/kg
Benzo(k)fluoranthene	Not Applicable
Dibenzo(a,h)anthracene	54 mg/kg
Indeno(1,2,3-cd)pyrene	150 mg/kg

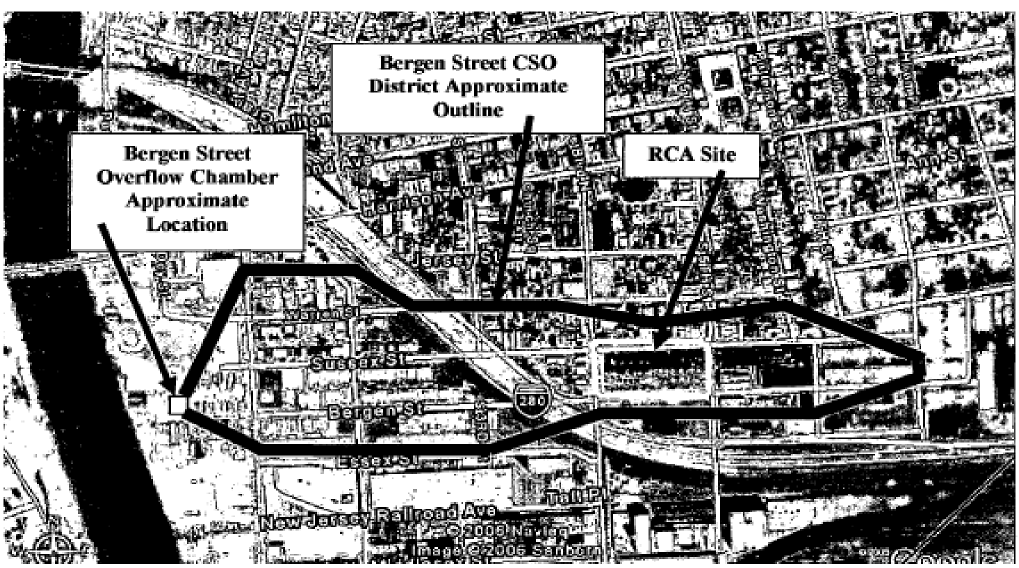
5. COC Pathways

Approximately 75 percent of the 5th Street Facility is occupied by buildings, and the remaining area is paved. The 5th Street Facility is located approximately a half a mile inland from the Passaic River (PAP-00074239; PAS-00048608).

Sanitary and Storm Sewer

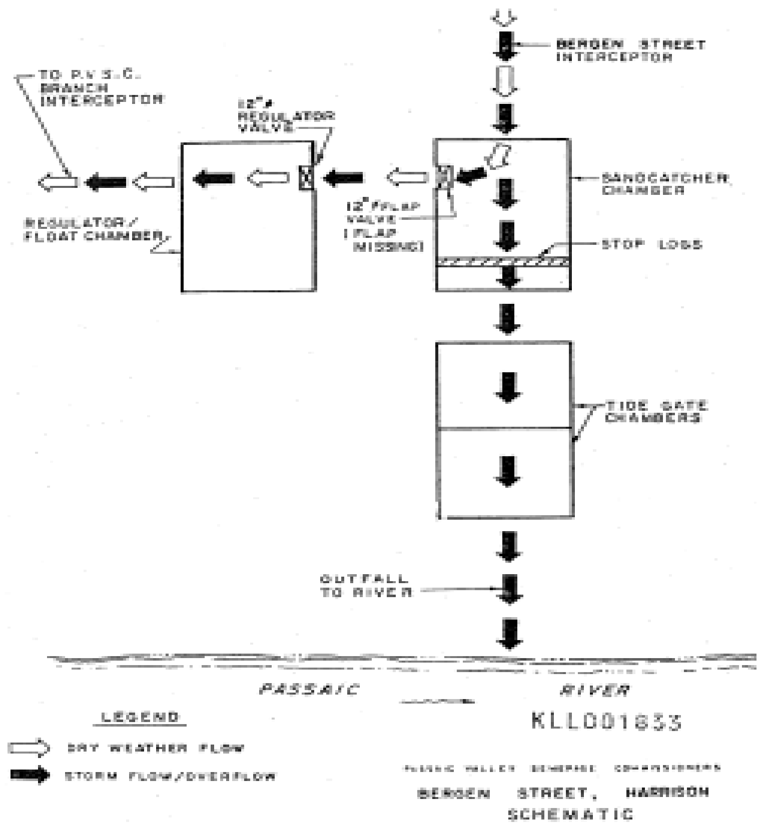
The 5th Street Facility was connected to the PVSC system in 1924 (PAP-00342795). The 2006 Extraction Form stated that the 5th Street Facility was located within the Bergen Street combined sewer outfall (CSO) district (PAS-00122715).

A figure showing the extent of the Bergen Street CSO as provided in the 2006 Extraction Form is presented below (PAS-00122716):



Historical PVSC reports stated that during wet weather events, a portion of the combined sewer and storm water flow from the Bergen Street CSO entered the main interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River (PAS-00122716, 36). The approximate length of the combined sewers in the Bergen Street district was 9,200 linear feet, and the estimated combined flow needed to produce an overflow was 4.4 MGD (million gallons per day), according to the PVSC *Report Upon Overflow Analysis, Bergen Street, Harrison*, dated 1976. The Bergen Street CSO served 72 acres and had an average daily flow of 0.83 MGD during dry weather and 1.13 MGD during wet weather. Of the 9,200 linear feet of combined sewer, 5,800 linear feet are made up of 8 to 12-inch diameter pipes, while 3,400 linear feet are made up of 15 to 24- inch diameter pipes (PAS-00122740, 42).

A schematic of the Bergen Street CSO is presented below (PAS-00043989):



According to the 2015 RI Report, historical foundation plans showed floor drains from Building A that were connected to piping that led to sewers in 5th Street, 6th Street, and Sussex Street in Harrison. Floor drains were also observed in the Vo-Toys rawhide flavoring production area on the second floor of Building A, as well as the wash room, in the northwestern part of the warehouse area in Building B, and in the boiler room. Some floor drains were noted to be clogged; however, an attempt to clean out clogged drains was not successful. No evidence of discharge to the floor drains was observed (PAP-00074685).

In addition, there were seven catch basins located at the 5th Street Facility. The seven catch basins were located within the courtyard area between the buildings; one of these seven catch basins was situated on top of the former methanol and trichloroethene USTs and was removed during removal of these USTs, but the other six catch basins remain in place at the 5th Street Facility (PAP-00074685). No information regarding when the catch basins were installed could be located in the available file materials.

Waste Effluent Surveys from 1972 and 1975 reported effluent sample results for copper and lead; mercury was not reported in either survey. The waste Effluent Survey dated June 16, 1972 reported a result for copper only (<0.05 milligrams per liter [mg/L]). The Waste Effluent Survey dated October 2, 1975 reported copper detected at 0.097 parts per million (ppm) and lead detected at 0.010 ppm (PAS-00122717, 22, 32). Available references did not include specific effluent sampling/monitoring data reports.

Documented wastewater discharge volumes were as follows:

- According to a *PVSC Waste Effluent Survey*, dated June 16, 1972, for the 5th Street Facility in 1971, 184,985,038 gallons of waste water were discharged to the sanitary sewer. No volume was discharged to "Storm Sewer, River, or Ditch." No COCs were detected above detection limits in the effluent (PAS-00122721-22). The principal discharge was from 8 am to 4 pm, Monday through Friday. The average discharge rate was 791.43 gallons per minute over the sampling period (PAS-00122722).

- According to a *PVSC Waste Effluent Survey*, dated October 2, 1975, for the 5th Street Facility in 1974, 145,094,048 gallons of waste water were discharged to the sanitary sewer. No volume was discharged to "Storm Sewer, River, or Ditch" (PAS-00122729, 32).

- According to the *RCA Plant Facilities Survey*, dated December 31, 1975, the 5th Street Facility reported that sanitary wastewater was discharged at a rate of 173 gallons per minute, industrial wastewater at 209 gallons per minute, cooling water at 8 gallons per minute, and other discharges at 15 gallons per minute (PAP-00341688).

Direct Release

There is no information regarding direct release in the available file material.

Spills

As discussed in the 2015 RAWP and 2015 RI Report, during the 2012 UST removals, visual evidence of a release from the 550-gallon UST was observed in soil. NJDEP was notified and case No.12-06-06-0920-51 was assigned to the 550 gallon UST (contents unknown). Case No.12-06-07-1005-05 was assigned to the 3,000 gallon trichloroethene (TCE) UST when holes were noted in the UST (PAP-00074242; PAP-00074662).

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

The PVSC discharge permit number for the Bergen Street CSO is 015/H-006 (PAP-00211195).

According to a letter from RCA to EPA dated April 9, 1980, RCA submitted a signed Affidavit of Exemption from NPDES No. NJ0000230 for the Harrison Plant due to its closure in 1976 (PAP-00343675-77). No permits specific to the 5th Street Facility were included in the available file materials.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Onsite Remedial Investigation Report, Vo-Toys Site*, dated January 28, 2015 (PAP-00074652);
- *Remedial Action Work Plan, Vo-Toys Site*, dated July 15, 2015 (PAP-00074230);
- *Mercury Data Summary Report, Vo-Toys Site*, dated October 2016 (PAP-00074833); and.
- *Building Assessment Summary Report, Vo-Toys Site*, dated January 2019 (PAP-00342910).

Sewer

According to the 2015 RAWP, sediments were removed from the catch basins and the catch basins were visually inspected. The catch basins were constructed of brick with pipe between them. The sidewalls had a cement coating, with the exception of CB-01, which had no cement on the sidewalls, and CB-04, which was constructed more recently and connected to the sewer system. Samples were collected at the catch basins, but the samples were not analyzed for COCs (analyzed for volatile organic compounds [VOCs] only) (PAP-00074248).

Soil

A remedial investigation was conducted between August 2013 and August 2014 to investigate ten AOCs (PAP-00074242-43). According to the 2015 RI Report, soil sampling included collection from multiple soil borings at multiple depths at each of the ten AOCs (PAP-00074749-56).

An area of approximately 750 square feet of PCB-impacted soil was identified between 0.5 feet bgs to 4.5 feet bgs at the former transformer substation (PAP-00074682). Concentrations ranged from non-detect to 2.12 milligrams per kilogram (mg/kg) (PAP-00074308). Floor scape samples from Building B and samples of wood and concrete debris were analyzed for PCBs and concentrations ranged from 0.8 to 736 mg/kg, but PCBs were not detected in soil samples beneath the building floors (PAP-00074684).

PAH-impacted soil was encountered to a depth of approximately 3 feet bgs in a small area stained with hydraulic oil at Building B (PAP-00074249). Concentrations were as high as 380 mg/kg for benzo(a)anthracene, 290 mg/kg for benzo(a)pyrene, 360 mg/kg for benzo(b)fluoranthene, 54 mg/kg for dibenzo(a,h)anthracene, and 150 mg/kg for indeno(1,2,3-cd)pyrene (PAP-00074732).

According to the 2016 Mercury Report, the maximum mercury concentration in soil at Building A was 7.3 mg/kg within an elevator pit at a depth of 5.5 feet bgs. The maximum mercury concentration in soil at Building B was 75 mg/kg at a depth of 4.2 feet bgs (PAP-00074857). The maximum mercury concentration in soil at Building C was 56 mg/kg within an elevator pit at a depth of 11.5 feet bgs (PAP-00074858).

Remedial Activities

According to 2015 RI Report and 2015 RAWP, one 550 gallon unknown content UST, two 1,500 gallon methanol USTs, and one 3,000 gallon TCE UST were removed between June and August 2012. Previously, in June 1998, a 10,000-gallon No. 2 fuel oil UST was decommissioned and NJDEP issued a "no further action" (NFA) letter for this decommissioning in February 1999 (PAP-00074242; PAP-00074662). Given the presence of fuel oil, water, and sand in the 550 gallon UST, it was determined to be an unknown petroleum hydrocarbon tank (PAP-00074254). Approximately 21 tons of soil excavated during the UST removals was disposed off-site (PAP-00074255).

The 2019 Building Assessment stated that lead paint abatement power washing was conducted at Building B and on the third floor of Building A in October 2015 (PAP-00342926).

The 2015 RAWP proposed removal of approximately 2,900 cubic yards of mercury impacted soil at AOC-A (Former Waste Oil UST) and removal of approximately 2,700 cubic yards of PCB impacted soil at AOC-J1 (Former Transformer Substation) (PAP-00074275). In addition, the removal of the entire floor slab of Building B, as well as three feet of soil below the slab, was proposed (PAP-00074276). According to the 2016 Mercury Report, this work began in December 2015 with saw cutting of the building

slabs, but work was stopped in January 2016 due to the mercury vapor survey results (PAP-00074845). The 2019 Building Assessment stated that a polyethylene sheeting cover was installed over the first-floor slab within Building B in June 2016 as a housekeeping measure until the RAWP implementation could be restarted (PAP-00342925).

Mercury vapor monitoring was conducted between January and July 2016 during site preparation for implementation of the RAWP. The maximum reading was 762 ug/m^3 recorded on June 22, 2016 on the first floor of Building B. The reading was from floor level and a visible bead of elemental mercury was present (PAP-00074851-52).

Several building materials were sampled for mercury in preparation for implementation of the RAWP. Maximum mercury concentrations were as follows:

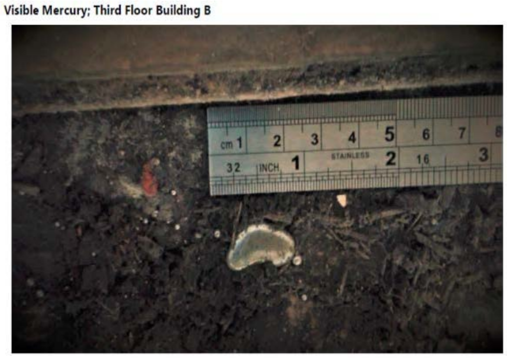
- Concrete – 650 mg/kg (lab analysis of total mercury);
- Tar paper (part of wood subfloor) – 52 mg/kg (lab analysis of total mercury);
- Wood floor – 29,000 mg/kg (lab analysis of total mercury);
- Concrete columns – 655 mg/kg (x-ray fluorescence [XRF] reading);
- Concrete ceilings/beams – 1,156 mg/kg (XRF reading); and
- Masonry walls/windows – 1,099 mg/kg (XRF reading) (PAP-00074856).

During floor removal, elemental mercury was observed on the first floor of Building B (PAP-00074859).

According to the 2019 Building Assessment, building assessments were conducted at Buildings A, B, and C between June 26, 2018 and October 4, 2018 and included pre-investigation cleaning (bird guano and carcasses), mercury vapor and XRF surveys, building material sampling, and a subsurface structure assessment (PAP-00342928). Visible mercury was not observed at Building A (PAP-00342937). Visible mercury was observed in four locations within Building B: three locations were observed on the first floor and one location was observed on the third floor (PAP-00342945). Visible mercury was observed in six locations on the second and third floors within Building C during the building assessment activities (PAP-00342953).

Photographs of visible mercury observed at Buildings B and C are presented below (PAP-00342946 and 54):

Visible Mercury; Third Floor Building B



Visible Mercury; Second Floor Building C

Note:
Mercury observed on tar paper layer, between two layers of wood flooring.

The 2019 Building Assessment concluded that the presence of elemental mercury (based on the total mercury analytical results) within the various floor layers and walls of Buildings A, B, and C meant there may be multiple potential long-term mercury vapor sources that cannot be readily accessed and remediated. In addition, based on the distribution of mercury vapor readings in the buildings, the extent of building materials generating mercury vapors appears to be throughout the buildings, rather than concentrated within a single area of the buildings (PAP-00342942, 51, 60).

Tables of mercury results for samples of various building materials from Buildings A, B, and C are presented below (PAP-00342939, 49, 57):

Building A Building Material Sample Results Summary

Material	Total Mercury Range (mg/kg)	TCLP Mercury Range (mg/L)
Flooring – Concrete	ND–242	ND–0.0915
Flooring – Wood	0.093–207	ND–0.0755
Flooring – Cinder	8.26–1580	0.0005–0.019
Flooring – Debris	1160	0.0006
Flooring – Tar Paper	16.4–1800*	0.0092–3.355*
Roof – Tar Paper	ND–7.76	ND
Wall – Masonry and Concrete	ND–464	0.0035–0.955
Wall – Brick	0.287–58.4	ND
Wall – Wood	22.1	Not Analyzed
Column – Concrete	0.404–128	Not Analyzed
Window – Concrete	0.768	Not Analyzed

Notes:
*Highest reported concentration
ND not detected above the laboratory detection limit.

Building B Building Material Sample Results Summary

Material	Total Mercury Range (mg/kg)	TCLP Mercury Range (mg/L)
Flooring – Concrete	ND–1900	ND–0.1940
Flooring – Wood	0.274–2560	ND–2.764*
Flooring – Cinder	3.35–1420	0.0570–0.3535
Flooring – Tar Paper	2880*	1.900
Flooring – Expansion Joint	126	0.0112
Roof – Tar Paper	ND–1.94	ND
Wall – Masonry and Concrete	0.464–45.8	ND–0.0115
Wall – Brick	0.836–145	0.0011
Wall – Plaster and Parge	2.09–31.7	ND–0.0017
Wall – Wood	1.97–583	0.0180–0.0530
Column and Window – Concrete	1.00–59.2	Not Analyzed
Window – Wood	1.29–53.3	Not Analyzed

Notes:
*Highest reported concentration
ND not detected above the laboratory detection limit

Building C Building Material Sample Results Summary

Material	Total Mercury Range (mg/kg)	TCLP Mercury Range (mg/L)
Flooring – Concrete	0.032–418	ND–0.0228
Flooring – Wood	3.83–7310	0.0029–2.800
Flooring – Cinder	9.74	0.0011
Flooring – Tar Paper	182–10800*	0.7000–5.200*
Flooring – Linoleum	7.28–101	0.0021–0.0327
Wall – Brick	1.5–139	ND–0.0313
Wall – Parge and Miscellaneous	0.441–106	Not Analyzed
Column, Beam and Ceiling – Wood and Miscellaneous	0.256–929	0.0005–0.0955
Window – Brick	0.992–220	0.0032–0.0158
Window – Wood	0.395–38.5	ND–0.0035
Window – Masonry and Parge	1.57–184	0.0020–0.0408

Notes:
*Highest reported concentration
ND not detected above the laboratory detection limit.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

GIVAUDAN FRAGRANCES CORPORATION

Facility Name, Address and Size: Givaudan Fragrances Corporation (Corp.) former Clifton Facility; Burton T. Bush, Inc.; The Givaudan Corporation; Givaudan-Delawanna; Givaudan Roure; Givaudan; Givaudan Fragrances Corp.; 125 Delawanna Avenue, Clifton, New Jersey; maximum build-out was approximately 31 acres; approximately 750 employees, three shifts per day during peak operations (PAS-00035827).

1. **Business Type:** Fine chemicals and fragrances (PAP-00345884)

2. **Time Period of Ownership/Operations**

Operator: 1924 to 1998
Owner: 1924 to 1998 (with the exception of a two-acre parcel on block 73.03, Lot 2.02 (PAP-00345330)

1924: Burton T. Bush, Inc. acquired the assets of the Antoine Chiris company on March 1, 1924, which occupied approximately 12.9 acres of the site. On August 14, 1924, Burton T. Bush, Inc. purchased an adjoining parcel also owned by Antoine Chiris. Givaudan Fragrances Corporation (Givaudan) purchased the assets of Burton T. Bush, Inc. on February 25, 1924 (PAS-00048099).

Givaudan acquired additional portions of the site through the purchase of adjoining and nearby parcels between 1924 and 1982 (PAS-00122997).

1963: The Roche Group acquired Givaudan in 1963 (PAS-00083378).

1991: The Roche Group spun-off its flavors and fragrances division, known worldwide as the Givaudan Roure companies. The Givaudan Roure companies operating in the United States prior to the spin-off were “Givaudan Roure Corporation,” the fragrance operating company, and “Givaudan Roure Flavors Corporation,” the flavors operating company. As a result of this spin-off, Givaudan Roure Corporation was merged into a new Delaware corporation, Givaudan Fragrances Corporation, in 1991 (PAP-00175934; PAS-00083378).

1998: Givaudan ceased manufacturing operations in June 1998. The cleaning of plant processing equipment continued until September 1998. All raw materials and chemicals were removed from the facility by the end of October 1998 and by December 1999 the plant was demolished (PAP-00178473; PAP-00175640).

1999: On March 8, 1999, Givaudan executed an Agreement of Sale with Reckson Morris Operating Partnership, LLP (Morris) (PAS-00033758; PAP-00168962; PAP-00175933).

2000: Givaudan Roure spun off as Givaudan in 2000 (PAS-00083378). The parent company is identified as Givaudan, SA, a Swiss corporation (PAS-00083377).

2000: Properties on the north side of Delawanna Avenue were sold in 2000. The 125 Delawanna Avenue property was sold in 2001. Givaudan retained ownership of a two-acre parcel located at 275 River Road in Clifton, New Jersey (PAS-00122997).

3. Operational History/COC Use and Presence at the Facility

General Operations

This subsection describes the operations that occurred at the site in general.

According to a *Request for Information Response Document*, dated July 9, 2004, in the 1940s and 1950s, Givaudan manufactured fine chemicals and fragrances referred to generally at that time as aromatic chemicals. From the 1960s through 1998, Givaudan also compounded and stored flavors and essences at Buildings 103 and 105, located on the north side of Delawanna Avenue. As stated in a letter from Givaudan counsel to NJDEP, dated July 26, 1983, there was no chemical synthesis in operations on the north side of Delawanna Avenue, which is where Buildings 103 and 105 were located (PAS-00083416). Feedstock raw materials consisted mostly of spices, essential oils, solvents, and acids. The raw materials were processed onsite using various processing and refining techniques such as compounding, mixing, distilling, purifying, drying, and autoclaving. The majority of finished goods were transferred into steel drums (liquid product) or bags (powdered product). The final products were either stored indoors or outside for collection by truck or railcar for distribution (PAS-00083342; PAS-00083350). According to a 1975 *Waste Effluent Survey*, the average production was listed as 15,000,000 pounds per year (PAS-00035827).

In addition, it is noted that according to a letter prepared by Givaudan, dated May 25, 1983, 2,4,5-trichlorophenol (2,4,5-TCP) was used as a raw material by Givaudan to prepare hexachlorophene (HCP), an antiseptic and germicidal agent employed in surgical soaps and pharmaceutical preparations. The product, also known as G-11®, was manufactured at the site beginning in the early 1940s starting with “relatively small quantities” and reaching an annual volume of a few million pounds (PAP-00174267). The early 1940s represented a time when HCP pilot studies were completed and small-scale production was done before ramping up to full production. As noted in the July 26, 1983 letter to NJDEP, Givaudan started industrial production of HCP in 1947 (PAS-00083414). Givaudan reported that the process to manufacture HCP involved the condensation of 2,4,5-TCP with formaldehyde. The only waste material resulting from the process was reportedly bentonite clay (PAP-00174267). The May 25, 1983, letter states that 331,000 pounds of 2,4,5-TCP were brought onsite and consumed onsite per year on average from 1978 through 1982 (PAP-00174269). According to a *NIOSH Dioxin Registry Site Visit Report of Givaudan Corporation*, prepared by the National Institute for Occupational Safety and Health, dated March 1990 (1990 NIOSH Report), Givaudan produced HCP from 1945 to May 1984 (PAP-00170545). As noted above, actual industrial production did not start until 1947 (PAS-00083414).

Finally, according to the 1990 NIOSH Report, Givaudan also produced 2,4,5-TCP for use in HCP production between 1945 and 1949 (PAP-00170545); however, dates for 2,4,5-TCP production vary in the available file material. According to an *Administrative Consent Order*, dated March 5, 1987, Givaudan manufactured 2,4,5-TCP at the site in 1947 and 1948 (PAS-00001808). Similarly, in a letter from Givaudan to the U.S. Environmental Protection Agency (U.S. EPA), dated October 26, 1983, Givaudan stated that they produced 2,4,5-TCP in 1948 and 1949 (PAS-00048133-34).

According to a letter from Givaudan to EPA, dated October 26, 1983, Givaudan records show the purchase of a “small amount” of “technical grade” 2,4,5-TCP from Dow Chemical for experimental purposes only. In 1948 and 1949, Givaudan developed its own method to manufacture technical grade 2,4,5-TCP, which was distilled into "pre-purified" 2,4,5-TCP and used in HCP manufacture. During this time, Givaudan manufactured approximately 305,000 pounds of pre-purified 2,4,5-TCP for on-site consumption in making HCP (PAS-00048134). Givaudan licensed the pre-purified 2,4,5-TCP method to Hooker in return for Hooker producing pre-purified 2,4,5-TCP (using Givaudan’s method) exclusively for sale to Givaudan. This agreement was in effect from 1949 until 1971 (PAP-00168592; PAS-00084000).

HCP and 2,4,5-TCP production are discussed further in a subsequent subsection below.

<u>OU2 COCs Associated with Operations</u>

This subsection lists the OU2 contaminants of concern (COCs) identified in the available file material as being associated with site operations, organized by date.

In 1980, the facility reported that copper chloride (3,360 pounds), copper chromite (960 pounds), lead acetate (240 pounds), naphthalene (46,080 pounds), “trichlorophenol” (360,000 pounds), diesel fuel (34,560 pounds), No. 2 fuel oil (45,120 pounds), and No. 6 fuel oil (21,646,800 pounds) were “transferred, refined, processed or stored” at the site at that time (PAP-00182118-19, 21).

According to a *Hazardous Waste Investigation,* dated June 5, 1980, it was ascertained that Givaudan was generating and storing polychlorinated biphenyls (PCBs) onsite. The report states that U.S. EPA inspectors had a report concerning Givaudan's PCB practices, but additional details were not available (PAP-00172019). An undated record titled “Exhibit No. 2, Transformers – PCB Oil-Filled Electrical Transformers” states that the facility historically had 30 PCB-containing transformers (PAP-00176671-72). According to a *Plans for Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated July 1982, Givaudan had 38 transformers in operation containing PCBs (PAP-00182108). According to a *Plans for Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, Givaudan had 32 transformers in operation containing PCBs (PAP-00183371). Between 1975 and 1983, one drum of waste PCBs was shipped offsite for disposal (PAS-00083999).

According to a *Selected Substances Report,* dated August 13, 1980, cuprous chloride and copper chromite were used by the facility. The facility reported that cuprous chloride contained 64% copper, and that copper chromite contained 41% copper. The total amount of copper brought to the site at that time was reported as 1,997 pounds (PAP-00180568-70, 77).

According to a letter from Givaudan to U.S. EPA, dated October 26, 1983, although Givaudan manufactured HCP for many years, all the HCP manufactured and marketed by Givaudan was produced from pre-purified 2,4,5-TCP as opposed to technical grade 2,4,5-TCP. In 1948 and 1949, Givaudan also produced technical grade 2,4,5-TCP, which it purified (i.e. distilled) prior to use for the manufacture of HCP. HCP manufactured using technical grade 2,4,5-TCP may result in 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) contamination, while TCDD contamination "is not expected to occur" in the manufacture of HCP made with pre-purified 2,4,5-TCP, using a reaction which occurs at rather low temperatures and at an acidic pH (PAS-00048133-34; PAS-00033680). This is discussed further in a subsequent subsection below.

A *Community Right to Know Survey for 1995* identified copper chromate, creosote oil, No. 2 fuel oil, No. 6 fuel oil, naphthalene, and "trichlorophenol" as being present at the facility (PAS-00084216, 17, 25, 42, and 59).

Waste disposal records state the following OU2 COCs were disposed by the facility in 1999 during facility demolition:

- mercury (300 pounds)
- waste containing mercury (225 pounds)
- waste containing lead nitrate (200 pounds)
- mercury (600 pounds)
- PCBs (182 kilograms)
- mercury in manufactured articles (5 gallons) (PAS-00084328-34).

<u>General Wastewater Disposal Practices</u>

This subsection presents a description of wastewater disposal practices in general.

According to a *Documentation of Environmental Indicator Determination*, dated September 29, 2008, Givaudan and previous owners of the site used portions of the property for waste disposal including various cesspools, spent acid pits, a chemical landfill, and two chemical effluent pits. The document states a chemical sewer system was installed in the 1960s to collect and discharge process wastewater. However, Givaudan's December 3, 2009 Supplemental Response for Information confirmed that the date of original sewer installation was "prior to March 1946" and the reference to a sewer installation in the 1960s was incorrect (PAS-00033657-8). A sewer map dated March 1946 depicts the historical layout of the chemical sewer system at Givaudan (PAS-00084318). However, revisions were made to this drawing as late as 1969, as stated in the title block of the drawing. An aerial photograph from 1947 does not contain the infrastructure shown on the March 1946 drawing in the southern portion of the site

and an area of undisturbed land is present to the south of two surface impoundments observed in the eastern-central portion of the site (PAS-00048105-108). Based on this, it is unclear if the sewer line extending to the southernmost intersection with River Road where it connects to the City of Clifton sewer system existed in 1946. A 1949 photograph shows that a Spent Acid Pit and Wastewater Detention Pond appear as local depressions with defined embankments/berms as sidewalls. The photograph also states that a handwritten note from June 1949 states that according to a well driller, there are five wells at the facility and that waste is dumped into pits adjacent to the plant (PAS-00048109). In 1951, the Wastewater Detention Pond was no longer present and the area appeared to have been re-graded (PAS-00048474). A 1953 photograph shows the chemical sewer discharged to the City of Clifton sewer (PAS-00048114). In 1954, the Spent Acid Pit was no longer present (PAS-00048115).

According to a letter prepared by Givaudan, dated November 19, 1980, much of the operations included discharge of liquid waste, mostly aqueous, into a site sewer system which underwent pretreatment to adjust the pH before it was discharged to the Passaic Valley Sewage Commissioners (PVSC) system. Combustible waste, both hazardous and nonhazardous, after blending, was used as a noncommercial fuel to produce steam for the site's operation beginning in 1950 (PAP-00182084). The treatment system was in place at least as early as 1978 as it is referenced in regard to the sewer line break that occurred in the City of Clifton sewer line that was suspended along the bridge over the Third River (PAP-00170539).

Portions of the original sewer were abandoned and replaced in the mid-1980s, while other portions were retrofitted with the new chemical sewer that consisted of fiberglass-reinforced plastic pipe with secondary containment (PAP-00168962).

Wastewater disposal practices are discussed further in Section 5 below.

<u>HCP Production</u>

This subsection presents a description of the HCP (also known as G-11®) production process.

According to a letter prepared by legal counsel on behalf of Givaudan, dated July 26, 1983, production of HCP started in 1947 and continued in Buildings 58, 59, and 60. Additionally, in 1970, 1971, and 1972, HCP was produced in Building 9. Grinding and packaging of the final product was performed in Buildings 47, 75, and 75A (PAS-00083414; PAP-00176628; PAP-00170546). According to a letter prepared by Givaudan, dated May 25, 1983, the process to manufacture HCP involved the condensation of 2,4,5-TCP with formaldehyde (PAP-00174267). This is consistent with the 1990 NIOSH Report, which states that Givaudan produced HCP by the condensation of purified 2,4,5-TCP and paraformaldehyde in the presence of a sulfuric acid catalyst. A typical batch used 1,500 pounds of 2,4,5-TCP to produce 1,500 pounds of HCP (PAP-00170546-47). The only waste material resulting from the process was reportedly bentonite clay (PAP-00174267).

A schematic of the HCP production process is presented in **Appendix B-1**.

HCP production volume by year between 1947 and 1984 is presented in **Appendix A-1.**

According to *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, information from "published sources" stated that it was "highly unlikely" that Givaudan's HCP manufacturing process generated TCDD because it used acidic conditions and low temperatures in its process. It states that documents prepared by Dow Chemical (a 2,4,5-TCP supplier) state that TCDD may be produced during use of TCP under alkaline conditions and in temperatures greater than 100 degrees centigrade, which is distinct from the acid process employed at Givaudan (PAS-00048081).

Use of Technical Grade 2,4,5-TCP

This subsection describes documented handling and use of technical grade 2,4,5-TCP by Givaudan. This is relevant as, according to a letter from Givaudan to U.S. EPA, dated October 26, 1983, HCP manufactured using technical grade 2,4,5-TCP may result in TCDD contamination (PAS-00048133-34; PAS-00033680). As stated previously, according to a letter from Givaudan to EPA, dated October 26, 1983, Givaudan records show the purchase of a "small amount" of technical grade 2,4,5-TCP from Dow Chemical for experimental purposes only. From 1948 to 1949, Givaudan developed its own method to manufacture technical grade 2,4,5-TCP, which was distilled into pre-purified 2,4,5-TCP and used in HCP manufacture. During this time, Givaudan manufactured approximately 305,000 pounds of pre-purified 2,4,5-TCP for on-site consumption in making HCP (PAS-00048134).

According to a January 18, 1978, internal report prepared by Givaudan, samples of "Pure-Dow" and "Tech.-Dow" 2,4,5-TCP were analyzed for their suitability in making HCP (PAP-00168661). The report states that regardless of the method of analysis, it was apparent that Dow's "Tech. Grade of TCP" led to a HCP of much lower quality than either Dow's "TCP, Pure" or Celamerck's TCP (another 2,4,5-TCP supplier). It states that work was in progress to identify both the impurities in the "TCP, Tech." and in the HCP produced from it. In addition, it states that an attempt would be made to purify the "TCP, Tech." to the point where it could be used to produce an acceptable grade of HCP (PAP-00168665).

According to an internal document prepared by Givaudan, dated September 13, 1978, an internal report was prepared to put into record a proposed method by which it might be possible to make "acceptably pure" HCP from technical grade 2,4,5-TCP in existing equipment in Buildings 58-61 (PAP-00182221).

According to a December 8, 1978 internal report, three batches of HCP were produced in experimental runs, from 3,600 pounds of technical grade 2,4,5-TCP (94% purity) by a new process in plant equipment (PAP-00168698). The 2,4,5-TCP had a TCDD concentration of 8 parts per billion (ppb) (PAP-00168698-701).

According to a February 11, 1981 internal report, the plant had an inventory of 8,950 pounds of 2,4,5-TCP ("TCP, Tech grade"). Givaudan's production and marketing departments requested an investigation into the possibility of converting this 2,4,5-TCP into HCP (PAP-00168735).

According to a letter prepared by Givaudan, dated October 5, 1983, there are no records describing 2,4,5-TCP equipment decontamination procedures, but that isopropyl alcohol, soap solutions, caustic, and steam were used at the time to clean existing processing equipment. It was unknown if these practices were used in the early 1950s (PAP-00181273; PAS-00048135).

According to a letter from Givaudan to U.S. EPA, dated October 26, 1983, Givaudan stated that the following wastes in the following approximate quantities were generated during the 2,4,5-TCP purification step in 1948 and 1949: (1) 2-3 pound/pound of light fractions; and, (2) 0.2-0.3 pound/pound of still bottoms. It was believed that the light fractions and still bottoms were drummed; however, Givaudan had no records describing the methods of collection, storage, or disposal of such wastes, the names and addresses of haulers who might have hauled such wastes, or disposal site locations (PAS-00048135). Givaudan had no records from which the total amount of such wastes generated during the history of its facility could be determined, and no records from which the total amount of wastes generated in the manufacture of technical grade 2,4,5-TCP could be determined. Finally, Givaudan could not determine the dates of disposal, the amount disposed on each occasion, the waste hauler, or the disposal location (PAS-00048136).

<u>2,4,5-TCP Production</u>

This subsection describes Givaudan's manufacture of 2,4,5-TCP.

According to a letter prepared by legal counsel for Givaudan, dated July 26, 1983, 2,4,5-TCP production occurred in Buildings 54 and 60 in 1947, 1948, and 1949 (PAS-00083414). As discussed previously, the years during which Givaudan produced 2,4,5-TCP vary in the available records. According to the 1990 NIOSH Report, Givaudan produced 2,4,5-TCP for use in HCP production from 1945 to 1949 (PAP-00170545). According to an *Administrative Consent Order*, dated March 5, 1987, Givaudan manufactured 2,4,5-TCP in 1947 and 1948 (PAS-00001808). In a letter from Givaudan to the U.S. EPA, dated October 26, 1983, Givaudan stated that they produced 2,4,5-TCP in 1948 and 1949 (PAS-00048133-34).

A figure depicting the location of the 2,4,5-TCP production is presented in **Appendix B-2**.

According to an internal report on a U.S. EPA visit to the site, dated August 20, 1976, Givaudan stated that processing of 2,4,5-TCP was done in an acidic medium, and assured U.S. EPA that no TCDD was formed (PAS-00048294).

According to a letter from Givaudan to U.S. EPA, dated October 26, 1983, Givaudan manufactured technical grade 2,4,5-TCP, which was distilled into pre-purified 2,4,5-TCP and used in HCP manufacture. It states that 305,000 pounds of pre-purified 2,4,5-TCP was produced from technical grade 2,4,5-TCP. All technical grade 2,4,5-TCP was believed to have been used to produce pre-purified 2,4,5-TCP. The letter also notes that records show the purchase of a small amount of technical grade 2,4,5-TCP from Dow Chemical for experimental purposes only. Givaudan believes that technical grade 2,4,5-TCP was manufactured by the alkaline hydrolysis of 1,2,4,5-tetrachlorobenzene with caustic soda dissolved in ethylene glycol. After reaction, a batch was neutralized with muriatic acid and a sodium chloride precipitate was removed by filtration. The filtrate was diluted with water and the 2,4,5-TCP was extracted with benzene. The benzene extract was washed with water and the benzene was removed by distillation. Ethylene glycol was recovered by fractionation and was reused in the process (PAS-00048134-35, 254, and 256).

It is noted that according to the 1990 NIOSH Report, there are insufficient records to reconstruct the detailed process information for 2,4,5-TCP manufactured by Givaudan (PAP-00170546).

Documentation of TCDD Contamination Associated with HCP and 2,4,5-TCP Production

According to the 1990 NIOSH Report, TCDD is a contaminant found in 2,4,5-TCP and/or its sodium salt, which are raw materials used to produce chemical compounds such as 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and 2,2'-methylene-bis (3,4,6-trichlorophenol) hexachlorophene (HCP) (PAP-00170544).

The following is a discussion of documentation of TCDD contamination associated with HCP and 2,4,5-TCP production at the site:

- According to an undated file prepared by Givaudan, Givaudan's specification called for less than 10 ppb TCDD in 2,4,5-TCP. The file also reported that wastewater from the manufacture of HCP had been tested and no detectable quantities of TCDD were found (PAS-00033680).

- According to the 1990 NIOSH Report, Givaudan collected six HCP samples, each being a bulk from two to four lots of HCP, manufactured during the second half of 1969 and five samples of HCP from single, random lots produced in 1970. No detectable levels of TCDD were found in the 11 samples; the limit of detection ranged from 0.01 parts per million (ppm) to 0.03 ppm. An additional nine HCP samples were analyzed on October 27, 1970, and one sample on March 12, 1971. All 10 samples were non-detect for TCDD; the lower limit of detection ranged from 0.01 ppm to 0.1 ppm. Givaudan began monthly sampling of random lots of HCP for TCDD in January 1976. A total of 212 samples were analyzed between January 1976 and July 1977. It is reported that 90 percent of the HCP sample results contained less than 1.0 ppb TCDD. Seventeen samples had detectable concentrations of TCDD ranging from 1.5 ppb to 4.0 ppb with an arithmetic mean of 2.4 ppb (PAP-00170552-53).

- A sample data record, dated March 30, 1970 states that TCDD was detected at the following concentrations in various samples from the 2,4,5-TCP process at the Hooker facility:

    - Extractor feed sample: 3.0 ppm;
    - "Crude Charged to Still" sample: 12.0 ppm; and,
    - TCP Still Residue sample: 230 ppm.

  TCDD was not detected in a remaining nine samples, with detection limits ranging from 0.01 ppm to 1.0 ppm (PAS-00048146).

- According to an *Investigations Concerning the Possible Presence of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin in Givaudan's Commercial Hexachlorophene*, dated August 4, 1970, 2,4,5-TCP was purchased by Givaudan exclusively from Hooker Chemical Corporation who manufactured a specially purified grade of 2,4,5-TCP for Givaudan. Hooker Chemical Corporation gave Givaudan "firm assurance" that their TCP did not contain any TCDD down to a level of less than 0.1 ppm (PAS-00048356). According to the report, in the samples of commercial HCP investigated, no TCDD could be detected at a limit of sensitivity of 0.03 ppm (PAS-00048357).

- Analysis of three samples of 2,4,5-TCP from Givaudan's supplier in 1976, ICMESA, by U.S. EPA, identified TCDD at concentrations ranging from <2.0 ppb to 1.9 ppb. According to the memorandum, the TCDD concentrations reported by Givaudan for these same three samples are 2.0 ppb, 2.0 ppb and 14.0 ppb. However, the memorandum further states that "[t]he results are quite consistent with those reported by Givaudan … and indicate a very low level of 2,3,7,8-tetrachlorodibenzo-p-dioxin" (PAS-00048297-98).

- An inter-office memorandum, dated June 29, 1976 stated that a quality control specification should be officially established at the site governing the TCDD content of the 2,4,5-TCP used in the production of G-11®. It states that the TCDD limits should have been set to less than 50 ppb (0.05 ppm) (PAP-00183316).

- A subsequent inter-office memorandum, dated July 1, 1976, stated "most lots" of Icmesa 2,4,5-TCP, for which Givaudan had analyses, had TCDD contents below 50 ppb. However, some had concentrations up to "about 80 ppb." The memorandum states that Dow's specification sheet for TCP stipulated less than 0.1 ppm or 100 ppb TCDD (PAP-00183315).

- According to an inter-office memorandum, dated December 6, 1976, the "official Finished Product Specifications for G-11" was a TCDD concentration of less than 20 ppb (PAP-00168618).

- A letter prepared by Givaudan, dated December 17, 1976 states that the limit for TCDD in their final HCP had "recently been established at a value of 20 ppb maximum. This is a value that could possibly exist if 10 ppb of TCDD were in the T.C.P." (PAP-00168620).

- According to an internal report prepared by Givaudan, dated November 19, 1976, due to quality issues associated with Dow 2,4,5-TCP, Givaudan requested a lot of G-11® be analyzed by Dow. It was found to contain less than 1 ppb TCDD. This same material was analyzed by Givaudan and found to contain 15 ppb to 20 ppb TCDD after repetitive analyses (PAP-00169584).

- According to an inter-office memorandum, dated June 13, 1977, Dow committed to providing Givaudan with TCP with a maximum TCDD concentration of 0.01 ppm (PAP-00168658).

- According to an affidavit of the Givaudan Manager of Quality Assurance, the Quality Control Department began this routine analysis for TCDD content in HCP in May 1977. According to the document, review of the results since this laboratory began performing TCDD analysis stated that, prior to June 1978 the majority of samples analyzed were found to be less than 1.0 ppb with several samples (three to four) being below 4.0 ppb. It states that in many instances, the higher TCDD levels were attributed to interferences in the analysis which probably could be eliminated through reanalysis or additional sample clean-up. However, since the TCDD limit at that time was established at 10 ppb, these samples were not reevaluated. All samples evaluated after June 1978 were found to contain less than 1.0 ppb TCDD (PAS-00084004).

- According to an internal Givaudan letter, dated March 9, 1978, although the TCDD specification for pre-purified Dow TCP was less than 10 ppb, Givaudan believed that it consistently contained less than 1 ppb TCDD. Based on this, Givaudan personnel requested that Celamerck agree to provide TCP with less than 5 ppb TCDD. If this was not possible, Givaudan insisted that Celamerck provide the exact TCDD analysis for each batch or lot with a maximum of 10 ppb, noting that Celamerck proposed a maximum TCDD concentration of 15 ppb (PAS-00048194).

- According to a *NIOSH TCDD Registry Site Visit Report of Givaudan Corporation*, dated December 1990, eight samples of process by-products were collected in May 1983. The samples were analyzed for TCDD. Seven of the samples were non-detect for TCDD, with the lower limit of detection ranging from 0.1 ppb to 1.0 ppb. For the eighth sample, 150 nanograms per bottle was reported; however, no sample volume or concentration was given. In addition, three HCP process samples from Givaudan were analyzed by U.S. EPA as part of an analytical methods development study of process wastes and related materials from plants with potential TCDD contamination. No TCDD in excess of the minimum detectable concentrations, which ranged between 50 parts per trillion (ppt) to 140 ppt, was found in the Givaudan samples (PAS-00033689).

- Drums of HCP sampled in 1983 had concentrations of TCDD ranging from 16.1 ppt to 21.8 ppt, where the compendial limit was 50 ppb (PAS-00048299-302).

- According to a letter prepared by Givaudan, dated May 25, 1983, the only waste material resulting from the HCP production was reportedly bentonite clay. Analysis of the clay showed "some G-11," "about 1.0% Trichlorophenol," and no TCDD at the lowest detectable limit of 1.0 ppb. Process water was also analyzed for TCDD and found to be below detectable limits of 1 ppb (PAP-00174267-68).

- According to an interoffice memorandum, dated June 22, 1983, review of laboratory results stated that, prior to June 1978, the majority of samples of HCP analyzed were found to contain less than 1.0 ppb TCDD with several samples (three to four) having a concentration below 4.0 ppb. In many instances, the higher TCDD levels were attributed to interferences in the analysis "which probably could be eliminated through reanalysis or additional sample clean-up." However, since the TCDD limit at that time was established at 10 ppb, these samples were not reevaluated. All samples evaluated after June 1978 were found to contain less than 1.0 ppb TCDD (PAS-00048373).

- The 1990 NIOSH Report states that there was insufficient process information to comment on the potential degree of TCDD contamination of the 2,4,5-TCP. It states that the process was reported to have a distillation step, which would have removed "some or essentially all" of the TCDD. It goes on to state that the amount of TCDD contamination of the 2,4,5-TCP that would be carried through the subsequent production of HCP would depend on process operating conditions and the degree of purification that took place in the 2,4,5-TCP process, but that it was unlikely that any TCDD was formed during the production of HCP due to the process operating conditions. After 1949, with the closure of the on-site 2,4,5-TCP process, exposure to TCDD would have been limited to the amount of TCDD contamination in 2,4,5-TCP Givaudan purchased from outside suppliers (PAP-00170549).

A table presenting TCDD concentrations detected in 2,4,5-TCP feedstock from 1970 to 1983 is presented in **Appendix A-2**. A table presenting TCDD concentrations detected in HCP from 1970 to 1979 is presented in **Appendix A-3**.

4. Identified COCs

- PCBs (used, detected)
- Dioxins / Furans (generated, detected)
- PAHs (used, detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (used, detected)

PCBs

According to a *Hazardous Waste Investigation,* dated June 5, 1980, it was ascertained that Givaudan was generating and storing PCBs onsite. The report states that U.S. EPA inspectors had a report concerning Givaudan's PCB practices, but additional details were not available (PAP-00172019). An undated record titled "Exhibit No. 2, Transformers – PCB Oil-Filled Electrical Transformers" states that the facility historically had 30 PCB-containing transformers (PAP-00176671-72). According to a *Plans for*

Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR), dated July 1982, Givaudan had 38 transformers in operation containing PCBs (PAP-00182108). According to a *Plans for Discharge Prevention, Containment, and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, Givaudan had 32 transformers in operation containing PCBs (PAP-00183371).

According to a *Remedial Action Work Plan for Soils*, dated April 2000, surface soil samples were collected from eight locations surrounding two transformer pads that did not have secondary containment, which were located in the vicinity of Building 99. In addition, surface soil samples were collected from immediately below the asphalt in front of the doorways to two electrical switching stations. No PCBs were detected (PAP-00175777-78).

Dioxins / Furans

As discussed in Section 3 above, TCDD contamination was identified at the site associated with HCP and 2,4,5-TCP production.

According to Givaudan's November 10, 2016, Supplemental Response to 104(e) Request for Information, documentation states that prior to 1947, waste was discharged onsite into cesspools and pits. Further, a 1951 Givaudan memo discusses the recovery of HCP from the former waste pits, which also supports the facility's practice of discharging and handling its process waste water from HCP on site before the plant connected to the city sewer line on River Road by 1951-52 (PAS-00048078-79). According to an inter-office memorandum prepared by Givaudan, dated September 14, 1982, it was necessary to capture all discharges before they entered the central sewer and to remove any contaminants that were present. In order to do this, the memorandum states that all "dumps" from equipment/leaks and wash waters must be collected. It went on to propose that G-11® (HCP) grinding be moved to Building 58 in order to consolidate operations, and a pipe within a trench on each side of the Buildings 58, 59, and 60 be constructed. The trench was to channel all leaks and floor washes, and the pipe was to conduct all equipment dumps and washes through a closed pipe. Contaminants would be removed and drummed for disposal, materials dissolved in water would be sent to a steam still for separation, and water would be sent to the chemical sewer when tested and accepted (PAP-00181773). Note: No discharge monitoring data from this time period was identified in the available file material.

According to an *Administrative Consent Order*, dated March 5, 1987, pursuant to New Jersey Pollutant Discharge Elimination System (NJPDES) Permit (No. NJ0099414), effective October 1, 1982, Givaudan discharged industrial wastewater into the PVSC system and analyzed that wastewater discharge for TCDD contamination on a monthly basis at a detection level at or below 1 ppb. The document states that no TCDD contamination had been detected in any of the industrial wastewater discharge from the site (PAS-00001812; PAP-00173361). Note: Related discharge monitoring reports were not identified in the available file material.

A *Discharge Surveillance Report,* prepared by the New Jersey Department of Environmental Protection (NJDEP), dated August 25, 1989, states that Outfall 001 effluent was monitored for TCDD. The concentration reported was 1 ppt (PAP-00170514). Note: Additional related discharge monitoring reports were not identified in the available file material.

According to a *NIOSH TCDD Registry Site Visit Report of Givaudan Corporation*, dated December 1990, samples of the sanitary sewer discharge from the facility were collected in October, November, and December of 1982 and analyzed for TCDD. All three samples were below the 10 ppb limit of detection (PAS-00033689).

According to a letter from Tierra Solutions, Inc. to NJDEP, dated October 20, 2008, sediment samples collected from the stormwater pond had a TCDD detection of 214 ppb (PAP-00179607). Note: The source of this data is unclear and additional details regarding this data were not identified in the referenced document. According to a *Status Report, Remedial Investigation, Dioxin Contamination Non-Process Area*, dated November 15, 1984, in July 1984, a composite of the liquid and a bottom sediment sample were obtained from the stormwater pond for analysis as part of the remedial investigation for TCDD contamination at the site. No TCDD “was present” in the pond sediment sample nor in liquid from the pond itself (PAP-00183454-58). Concentration data were not included in the referenced document.

Givaudan entered into an *Administrative Consent Order* with NJDEP on March 5, 1987; an *Amended Administrative Consent Order TCDD* was signed on February 16, 1988. These consent orders required the investigation and remediation of TCDD contamination in soil (PAS-00001767-73). It is noted that NJDEP originally established a 1.0 ppb action level and 7.0 ppb cleanup goal for TCDD; a site-specific cleanup goal of 20.0 ppb was established in the early 1990s (PAP-00179704). Subsequently, a remedial action objective of 2.0 ppb for TCDD-impacted soils from zero to 12 feet below ground surface (bgs) was established in 1999 (PAP-00180350).

The *Draft TCDD Feasibility Study Report*, dated March 16, 1992 summarized all historical data TCDD collected for soil between 1983 and 1990, including: eight soil samples had been collected at the site with concentrations greater than the site-specific cleanup goal of 20.0 ppb TCDD; concentrations of these eight samples ranged from 22 ppb to a maximum of 200 ppb. Sample depths ranged from zero to 12 inches bgs (PAP-00179717-18). Numerous additional samples which were collected had concentrations greater than 1 ppb but less than 20 ppb, as discussed in Section 7 below.

PAHs

In 1980, the facility reported naphthalene (46,080 pounds), diesel fuel (34,560 pounds), No. 2 fuel oil (45,120 pounds), and No. 6 fuel oil (21,646,800 pounds) were “transferred, refined, processed or stored” at the site at that time (PAP-00182118-19, 21).

According to a NJDEP *Discharge Surveillance Report*, dated November 15, 1991, in June, July, and September 1991, the concentration of petroleum hydrocarbons detected at Outfall 001 exceeded the permit limit of 100 milligrams per liter (mg/L). The maximum detected concentration was 837 mg/L (PAP-00170853-55; PAP-00170938).

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to an on-site stormwater pond (PAP-00183367). A sample of stormwater pond sludge had a fuel oil concentration of 1,700 milligrams per kilogram (mg/kg) (PAP-00181906-08).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). High molecular weight polynuclear aromatic hydrocarbons (PAHs) were detected in post-excavation soil samples collected along the sewer lines (PAS-00033862-84).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, high molecular weight PAHs were detected in a sample collected from the stormwater pond in 1998/1999 (PAS-00033887-88).

Copper

It is noted that the southern part of the Givaudan site previously was occupied by National Anoid, whose operations related to the cleaning and melting of copper wire into copper ingots. The plant burned down in 1926 (PAS-00083993).

According to a PVSC *Heavy Metals Source Determination Study*, dated April 1980, Givaudan contributed 5.661 pounds of copper per day to the PVSC system (PAS-00035841). Copper data reported in wastewater discharge monitoring reports are summarized in **Appendix A-6**. As shown in Appendix A-6, the concentration of copper in wastewater in November 1994 (0.105 mg/L and 0.188 mg/L) exceeded the permit limit of 0.092 mg/L; otherwise, none of the reported detections were above the discharge limit of the permit.

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to an on-site stormwater pond (PAP-00183367). A sample collected from the stormwater runoff collection pond collected in 1982 contained copper at a concentration of 0.17 mg/L (PAP-00181896, 98). A sample of pond sludge had a copper concentration of 490 mg/kg (PAP-00181906-08).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were

collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). Copper concentrations detected in post-excavation soil samples along the sewer lines ranged from 660 mg/kg to 53,000 mg/kg (PAS-00033862-84).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, copper (1,100 mg/kg) was detected in a sample collected from the stormwater pond in 1998/1999 (PAS-00033887).

Lead

According to a PVSC *Heavy Metals Source Determination Study*, dated April 1980, Givaudan contributed 17.039 pounds of lead per day to the PVSC system (PAS-00035841). Lead data reported in wastewater discharge monitoring reports are summarized in **Appendix A-6**. As shown in Appendix A-6, the concentration of lead in wastewater in November 1994 (0.464 mg/L) exceeded the permit limit of 0.029 mg/L; otherwise, none of the reported detections were above the discharge limit of the permit.

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to an on-site stormwater pond (PAP-00183367). A sample collected from the stormwater runoff collection pond collected in 1982 contained lead at a concentration of 2.01 mg/L (PAP-00181896, 98).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). Lead concentrations detected in post-excavation soil samples along the sewer lines ranged from 440 mg/kg to 92,000 mg/kg (PAS-00033862-84). In addition to sewer lines, excavation was conducted in areas of subsurface features identified during sewer decommissioning activities such as cesspools and tanks (PAS-00033781-82). In the area of the former cesspools, lead was detected at a concentration of 19,000 mg/kg (PAS-00033854, 85).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, lead (1,500 mg/kg) was detected in a sample collected from the stormwater pond in 1998/1999 (PAS-00033887-88).

Mercury

According to a PVSC *Heavy Metals Source Determination Study*, dated April 1980, Givaudan contributed 0.0947 pounds of mercury per day to the PVSC system (PAS-00035841). Mercury data reported in wastewater discharge monitoring reports are summarized in **Appendix A-6**. As shown in Appendix A-6, none of the reported detections were above the discharge limit of the permit.

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to an on-site stormwater pond (PAP-00183367). A sample of stormwater pond sludge had a mercury concentration of 0.24 mg/kg (PAP-00181906-08).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). Mercury concentrations detected in post-excavation soil samples along the sewer lines ranged from 15 mg/kg to 130 mg/kg (PAS-00033862-84).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, mercury (23 mg/kg) was detected in a sample collected from the stormwater pond in 1998/1999 (PAS-00033887-88).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.[1]

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the U.S. EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[4]

[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).
[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

According to a *Geotechnical Investigation*, dated July 2, 1981, a review of a 1955 topographic map of the site showed that a difference in ground surface elevation of approximately 20 feet previously existed across the site. At the time of the report, the difference in elevation at the site was approximately eight feet, which led to the conclusion that portions of the site were filled since 1955. It appeared that the fill may have been placed between about 1955 and 1960, possibly during the construction of nearby Route 3 (PAP-00181329).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00033862-84, 86).

COCs Found in Onsite Excavation Soils		
COC	**Max Detected Concentration**	**Location**
Lead	92,000 mg/kg	Post-Excavation taken along stormwater sewers (PAS-00033852)
Copper	53,004 mg/kg	Former cesspools (PAS-00033854)
Mercury	130 mg/kg	Post-Excavation taken along stormwater sewers (PAS-00033852)
Benzo(a)anthracene	49 mg/kg	Excavation FYI samples (PAS-00033858)
Benzo(a)pyrene	79 mg/kg	Excavation FYI samples (PAS-00033858)
Benzo(b)fluoranthene	29 mg/kg	Post-Excavation bottom samples (PAS-0003384)
Benzo(k)fluoranthene	120 mg/kg	Excavation FYI samples (PAS-00033858)
Dibenzo(a,h)anthracene	14 mg/kg	Excavation FYI samples (PAS-00033858)
Indeno(1,2,3-cd)pyrene	25 mg/kg	Excavation FYI samples (PAS-00033858)

5. COC Pathways

According to an *Administrative Consent Order*, dated March 5, 1987, the Passaic River is located approximately one-third of a mile southeast of the site (PAS-00001783). According to a *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, there is no evidence of a defined drainage swale either on or off the property to the Passaic River in any of historical aerial photographs (PAS-00048077).

Sanitary and Storm Sewer

Process Wastewater Discharges

According to a *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, the site was connected to the Clifton City sewer system as early as 1926 and no later than 1951/1952. In the early 1950s, the chemical sewer system was connected to the City of Clifton sewer system on River Road. The earliest engineering drawing referencing a plant sewer system for the site was originally dated 1946 and contains a revision through 1969. Until 1946, the documentation stated some sanitary wastewater and process wastewater generated by

the plant was disposed of in cesspools and pits, with some waste used as supplemental fuel in the plant boiler (PAS-00048079-80, 114). A *Request for Information Response Document*, dated July 9, 2004, also states that up until approximately the 1950s on-site sanitary wastewater from Buildings 2, 3, 4, 5, and 6 was discharged to septic cesspools located onsite (PAS-00083366). The installation of a dedicated plant sewer system in 1946 and the appearance of a spent acid pit in 1947, followed by the development of a third surface water impoundment by 1949, supported the conclusion that plant process wastewater was initially handled onsite. The document goes on to state that an on-site stormwater management system was evident by 1947 and was supported by the appearance of a stormwater pond and a stormwater conveyance system, which remained in use until the plant closed (PAS-00048079).

According to the *Request for Information Response Document*, dated July 9, 2004, during the 1940/1950 timeframe, Givaudan had two sewer systems in place:

(1) Sanitary sewers collected sanitary wastewater via six-inch vitrified clay pipelines connected to an eight-inch vitrified clay main sanitary sewer line located on Delawanna Avenue. The six-inch vitrified clay sanitary sewer line collected sanitary sewage from Buildings 3, 4, 5, 6, 12, 34, 36, and 21 and directed the sanitary sewage to the City of Clifton via Delawanna Avenue.

(2) Industrial wastewater was collected by a chemical sewer and directed south to River Road for treatment by the City of Clifton. The chemical sewer collected wastewater from the manufacturing buildings. Wastewater was collected from floor drains and trenches constructed within concrete or tiled flooring. The drains consisted of vitrified clay pipe of various sizes that led to a main 18-inch vitrified clay chemical sewer that ran directly south and then southwest towards River Road (PAS-00083349).

According to the *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, the connection of the plant process waste stream (subsequently identified as Outfall 001) to the River Road sewer system appeared to have been made no later than 1951/1952, and perhaps several years earlier (PAS-00048080).

A *Remedial Action Report for Sewer Decommissioning*, dated February 2000, states that in the mid-1980s, portions of the original chemical sewer were abandoned and replaced, or retrofitted with the new chemical sewer consisting of secondary contained fiberglass reinforced plastic pipe. In addition, as manufacturing operations at the facility were altered or shut down, portions of the old chemical sewer were abandoned and not replaced (PAS-00033773; PAS-00083367-68).

In addition, Givaudan constructed a primary wastewater pretreatment plant in the mid-1980s to treat industrial wastewater that was being discharged to the PVSC system. Prior to construction of the pretreatment system, Givaudan discharged industrial wastewater directly to PVSC without pretreatment, pursuant to a user's fee arrangement with PVSC (PAS-00083365-66). According to a letter prepared by Givaudan, dated April 6, 1978, several steps were taken to eliminate the reoccurrence of pipe corrosion

including the repair of liming equipment and the purchase of additional equipment to better control the pH of effluent (PAP-00170539).

According to a letter prepared by Givaudan, dated September 26, 1988, the only wastewater pretreatment conducted was pH correction and an oil-water separation to comply with PVSC permit requirements. The wastewater was not physically or chemically treated to reduce suspended solids using a clarifier, settling tank or other means (PAP-00168740).

It appears that prior to the 1980s, contaminated wastewater may have been discharged to the PVSC system directly. According to an inter-office memorandum prepared by Givaudan, dated September 14, 1982, it was necessary to capture all discharges before they entered the central sewer and to remove any contaminants that were present. In order to do this, the memorandum states that all “dumps” from equipment, leaks and wash waters must be collected. It went on to propose that G-11® (HCP) grinding be moved to Building 58 in order to consolidate operation, and a pipe within a trench on each side of the Buildings 58, 59, and 60 be constructed. The trench was to channel all leaks and floor washes, and the pipe was to conduct all equipment dumps and washes through a closed pipe. Contaminants would be removed and drummed for disposal, materials dissolved in water would be sent to a steam still for separation, and water would be sent to the chemical sewer when tested and accepted (PAP-00181773).

The facility first received a NJPDES permit (No. NJ0099414) from NJDEP to discharge industrial wastewater to the PVSC system on October 1, 1982, effective through September 30, 1987 (PAP-00173361). The permit identified three outfalls (001, 002, 003) through which the site was allowed to discharge wastewater. Monitoring requirements included that for TCDD at Outfall 001. The TCDD discharge limit was “below method detection limit” (PAP-00173364).

According to historical aerial photograph notes, Outfall 002 discharged to the City of Clifton sewer line located on Delawanna Avenue which connected directly to the PVSC system. This line is believed to have been used primarily for sanitary waste water discharge (PAS-00048106, 114). Outfall 003 received “non-regulated wastewaters” from the cafeteria, laboratory, Building 105, Building 106 (used for storage of furniture and unused equipment), and Building 102 (used for packaging of printed material) (PAS-00036518).

The first record of a PVSC Sewer Connection Permit identified in the available file material following the NJPDES permit was a PVSC Sewer Connection Permit (No. 03401024) effective beginning March 17, 1991 (PAP-00170725). It is noted that a fourth outfall was identified in this permit (PAP-00170732). Details of this permit and other related records (and subsequent permits) are presented in the table below, which summarizes wastewater sources (or outfall descriptions), monitoring requirements for OU2 COCs, and discharge volumes for each outfall, as available.

It is noted that according to a letter prepared by Givaudan, dated September 12, 1995, Outfalls 003 and 004 were combined into one outfall (003) (PAP-00172207).

Summary of PVSC Outfall Information by Reference				
Reference	**Outfall**	**Wastewater Source/Description**	**Monitoring Requirements**	**Discharge Volume**
NJPDES Permit (No. NJ0099414), effective October 1, 1982, to September 30, 1987	001	Not documented (identified as "River Road outlet")	TCDD = below method detection limit	Not documented
	002	Building 103	None	Not documented
	003	Building 105	None	Not documented
Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR), dated July 1982 (PAP-00182102-03)	001	Effluent from chemical plant and sanitary waste	Not documented	30 million gallons/month
	002	Waste from sanitary and cleaning sources	Not documented	20,000 gallons/month
	003	Waste from office and non-chemical laboratory Building 100, also Flavor Manufacturing Center	Not documented	one million gallons/month
PVSC Sewer Connection Permit #03401024, effective March 17, 1991 to March 17, 1996 (PAP-00170725, 29-32)	001	River Road	None	Not documented
	002	Building 103	None	Not documented
	003	Building 105	None	Not documented
	004	Buildings 34, 36, and 72	None	Not documented
Letter prepared by Givaudan, dated June 15, 1993 (PAP-00171801, 06)	001	Aroma chemical manufacturing operation	Lead = 690 microgram per liter (μg/L) (maximum per day)	Not documented
	002	Fragrance compounding	Not documented	Not documented
	003	Sanitary wastewater, previously flavor operations	Not documented	Not documented
	004	Sanitary wastewater	Not documented	Not documented
Application for a Sewer Connection Permit, dated March 1996 (PAP-00172478)	001	River Road	Not documented	302,400 gallons/day
	002	Building 103	Not documented	26,100 gallons/day
	003	Buildings 100 and 102	Not documented	71,600 gallons/day
	004	Sanitary wastewater to Delawanna Ave.	Not documented	21,600 gallons/day
PVSC Sewer Connection Permit #03401023, effective March 17, 1996 to March 17, 2001 (PAP-00172521, 23-28, 30)	001	River Road	Copper = 3.02 mg/L Mercury = 0.08 mg/L (monthly averages) Lead = 690 μg/L (maximum per day)	Not documented
	002	Building 103	Copper = 3.02 mg/L Lead = 0.54 mg/L Mercury = 0.08 mg/L (monthly averages)	Not documented

The PVSC Sewer Connection Permit (No. 03401023) was terminated in February 1999 (PAP-00175005) following facility closure in 1998.

The City of Clifton sewer system connects to the Yantacaw Bypass operated by the PVSC. At the direction of PVSC, this manual bypass discharged to the Third River at the confluence with the Passaic River (PAP-00345562). In 1976, the overflow was classified by PVSC as inactive (PAP-00345562).

The locations of the wastewater outfalls are presented in **Appendix B-3**. Wastewater flow diagrams are presented in **Appendix B-4**.

According to a *Selected Substances Report* dated August 13, 1980, the facility discharged 2,000,000 to 3,000,000 gallons of wastewater per day to the PVSC system (PAP-00180554). According to an *Application for a Sewer Connection Permit*, dated March 1996, between July 1994 and June 1995, the facility discharged 2,000,000 gallons of sanitary wastewater; 102,147,000 gallons of process wastewater; and, 17,312,000 gallons of cooling water to the combined sewer (PAP-00172475).

A summary of wastewater discharge volumes identified in the available file material by year and outfall is presented in **Appendix A-4**.

Figures depicting the layout of the facility sewer system are presented in **Appendix B-5**.

<u>Stormwater Discharges</u>

A stormwater detention pond is visible onsite in aerial photographs as early as 1947 (PAS-00048105).

According to the *Givaudan Fragrances Corporation Supplemental Response to 104(e) Request for Information*, dated November 10, 2016, there was no overland path for runoff to the east from the site to the Passaic River and that any surface runoff would have been collected in the City of Clifton storm sewer system on River Road near the railroad underpass (PAS-00048077-8). It also states that historical aerial photographs stated that there was no visible channelized flow or surface drainage feature visible on or off of the plant property, and that the alleged existence of a possible surface water pathway that could have conveyed storm water flow from the site directly to the Passaic River was not supported by historical aerial photographs (PAS-00048077).

According to a document titled “Plant Storm Water” dated December 30, 1981, runoff from “a large part” of the plant went into the stormwater retention pond (capacity of 250,000 gallons) outside of Building 50. This included water from the surface as well as that which was piped; it then evaporated or seeped into the ground. In addition, water from the land surrounding Building 93 ran over the drum farm area onto River Road, and water from the area along the railroad tracks, Buildings 79, 93, and 95, drained onto the railroad property. Stormwater from remaining areas percolated into the ground (PAS-00048426).

According to a *Plans for Discharge Prevention, Containment and Countermeasure (DPCC) and Discharge Cleanup and Removal (DCR)*, dated April 1985, surface water run-off from the chemical plant was discharged to the on-site stormwater pond, a gully adjacent to the railroad tracks, the gutter of River Road, and the Passaic River via an existing storm sewer (PAP-00183367). There were originally two locations where stormwater exited from the site to the Clifton stormwater system: one at Delawanna Avenue; one at River Road. A third location was added along River Road as part of road work completed to improve Route 3 and Route 21 in 1961-1962. The Delawanna stormwater system discharged into Yantacaw Pond; the River Road storm sewer system at the eastern end of the site discharged into the Passaic River; the storm sewer at the River Road railroad overpass juncture conveyed stormwater to the Third River (PAS-00048128).

Stormwater drainage patterns in 1991 are depicted in **Appendix B-6**.

The facility held a NJPDES permit (No. NJ0088374), effective July 1, 1992 through June 30, 1997, for discharge of stormwater to “infiltration/percolation lagoons.” Discharges to the pond were not required to be monitored for OU2 COCs (PAP-00170994-995, 1000).

Stormwater runoff rates in 1993 identified in the available file material are presented in **Appendix A-5**.

A *Lagoon Closure Plan*, dated May 1, 1996, states that stormwater sewer inlets were located throughout the facility. At that time, the stormwater sewers and overland flow discharged to the Clifton stormwater sewer at Delawanna Avenue, a stormwater collection lagoon, the swale beside the railroad, River Road at the railroad crossing, and an inlet at River Road that all discharged through the City of Clifton storm sewer system and, ultimately, into the Passaic River (PAP-00181291).

According to the *Request for Information Response Document*, dated July 9, 2004, the stormwater pond was decommissioned (drained and filled) in 1999 (PAS-00083368-69).

It is noted that according to a *Request for Information Response Document*, dated July 9, 2004, Givaudan maintained a Stormwater Pollution Prevention Plan and stormwater permit (No. NJ0088315), which required monthly monitoring of stormwater effluent (PAS-00083363); however, no permits related to the discharge of stormwater to the Clifton storm sewer were identified in the available file material. Therefore, information related to discharge volumes, receiving water bodies, and monitoring requirements potentially presented in the permits are unavailable. A letter from NJDEP dated May 5, 1999, states the permit was revoked on that date (PAP-00175062).

Spills

According to a 1983 *Summary of Fires/Explosions/Accidents* document, three “TCP accidents” occurred at the site: one on August 13, 1976; one on January 17, 1977; and, one on September 11, 1980. The accidents were described as “TCP drum spilled in hot box.” In addition, a “G-11 accident” occurred on April 21, 1981, and was described as “G-11 reactor raw materials flew out of unsecured manhole cover onto building floor”

(PAP-00183358-59). According to an internal memorandum, dated January 18, 1977, the TCP accident on January 17, 1977 involved the spillage of one drum of TCP (PAP-00183530). Note: Additional information related to these spills/incidents was not identified in the available file material, and it is unclear if these incidents resulted in releases of OU2 COCs.

According to a letter prepared by Givaudan, dated April 6, 1978, the sanitary sewer line on River Road failed on March 15 and 21, 1978. The letter stated that the quantity of effluent discharged into the Third River because of these leaks was “extremely difficult to determine.” The letter states it could have varied from 10 gallons to 100 gallons per hour depending on the flow from the plant. The nature of the effluent at the time of the breaks was also “difficult to determine” (PAP-00170539; PAP-00181215). According to a memorandum, dated March 21, 1978, on March 20, 1978, PVSC personnel visited Givaudan in order to review their pH control system. This visit was due to the failure of the sanitary sewer line. The memorandum states that Givaudan was the largest contributor to this sewer line, and improper pH control by Givaudan “most likely” was the major cause of the failure. It was noted that Givaudan had replaced this section of sewer line at the end of July 1977 (PAP-00181217). According to a letter prepared by Givaudan, dated May 5, 1978, in August of 1977, Givaudan had replaced a leaking sanitary sewer line owned by the City of Clifton which was suspended from Passaic County Bridge No. 80 crossing the Third River. Although the line was actually owned by the City of Clifton, it carried domestic sewerage as well as industrial waste. The new sewer line was “eaten through” in eight months resulting in a “serious spill” into the river on March 15, 1978, and a less serious spill on March 21, 1978. As of April 10, 1978, the line had again been replaced (PAP-00181224). According to the April 6, 1978 Letter wastewater analysis taken in 1977 contained 0.212 copper, 0.766 lead and 0.0038 mercury the units were not specified (PAP-00181220).

According to an interoffice memorandum, dated August 5, 1981, because the “spent acid tank” was full, spent acid from the G-11® process was to be disposed by “very slowly” discharging to the sewer until the disposal problem could be resolved. The rate of dumping was specified to be approximately 2,750 pounds of acid every other day (PAP-00178319). Note: It is unclear if OU2 COCs were associated with the spent acid based on review of available file material.

According to an undated document titled *Investigation of G-11 Loss*, in August 1982, approximately 1,212 pounds of G-11® was accidentally washed down the sewer (PAP-00177132). Note: Additional details of this incident were not identified in the referenced document.

6. Regulatory History/Enforcement Actions

Inspections

According to correspondence issued by NJDEP, dated December 26, 1990, the facility received an “unacceptable” rating following a compliance evaluation inspection in part due the lack of a “Discharge to Ground Water (DGW) Permit” for the stormwater collection system which carried condensate from various pipes around the facility and

stormwater from the chemical storage areas into the on-site pond. The facility was directed to submit an associated permit application within 45 days (PAP-00170661-62). Givaudan filed the associated discharge permit application on April 12, 1991 (PAP-00170756). On May 29, 1992, the facility received a NJDPES permit (No. NJ0088374) which included amendments for a proposed surface impoundment and closure of the existing pond (PAP-00170991; PAP-00170994).

Violations and Enforcement Actions

On June 17, 1983, the governor of New Jersey issued an Executive Order declaring a state of emergency due to TCDD contamination at the site (PAS-00001801). The order required that all areas where TCDDs were detected at concentrations greater than or equal to 1.0 ppb be restricted from access, and that HCP production be suspended (PAS-00001801-03).

Givaudan entered into an *Administrative Consent Order* with NJDEP on March 5, 1987; an *Amended Administrative Consent Order TCDD* was signed on February 16, 1988. These consent orders required the investigation and remediation of TCDD contamination in soil (PAS-00001767-73).

On March 12, 2002, NJDEP issued a "no further action" letter for soils containing TCDD, which included the site use restrictions (PAS-00106564-66).

Permits

The facility first received a NJPDES permit (No. NJ0099414) from NJDEP to discharge industrial wastewater to the PVSC system on October 1, 1982, effective through September 30, 1987 (PAP-00173361).

The first record of a PVSC Sewer Connection Permit identified in the available file material following the NJPDES permit was a PVSC Sewer Connection Permit (No. 03401024) effective beginning March 17, 1991 (PAP-00170725). The PVSC Sewer Connection Permit was renewed on March 17, 1996, under permit No. 03401023 (PAP-00172521). The PVSC Sewer Connection Permit (No. 03401023) was terminated in February 1999 (PAP-00175006).

The facility also held a NJPDES permit (No. NJ0088374), effective July 1, 1992 through June 30, 1997, for discharge of stormwater to "infiltration/percolation lagoons" (PAP-00170994).

According to a *Request for Information Response Document*, dated July 9, 2004, Givaudan maintained a Stormwater Pollution Prevention Plan and stormwater permit (No. NJ0088315), which required monthly monitoring of stormwater effluent (PAS-00083363); however, no permits related to the discharge of stormwater to the Clifton storm sewer were identified in the available file material. A letter from NJDEP dated May 5, 1999, states the permit was revoked on that date (PAP-00175062). Givaudan ceased manufacturing operations in June 1998 (PAP-00178473).

Additional details regarding these permits are presented in Section 5 above.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Chemical Sewer Investigation*, dated September 20, 1983 (PAS-00001730);
- *Status Report, Remedial Investigation, Dioxin Contamination Non-Process Area*, dated November 15, 1984 (PAP-00183454);
- *Draft TCDD Investigation Report*, dated May 18, 1989 (PAP-00170281);
- *TCDD Investigation Report and Limited Investigation Report*, dated January 1991 (PAP-00170664);
- *Draft TCDD Feasibility Study Report*, dated March 16, 1992, (PAP-00179675);
- *Remedial Investigation Report for Soils*, dated October 1997 (PAP-00182246);
- *Remedial Action Report for On-Site Containment of 2,3,7,8-TCDD-Impacted Soils*, dated October 1999 (PAP-00345755);
- *Preliminary Assessment Report*, dated November 1999 (PAP-00175239);
- *Remedial Action Report for Sewer Decommissioning*, dated February 2000 (PAS-00033747);
- *Remedial Action Work Plan for Soils*, dated April 2000 (PAP-00175624); and,
- *Remedial Action Report for 2,3,7,8-TCDD Excavation and Disposal*, dated September 2000, Revised February 2001 (PAP-00180344).

Sewer

<u>Integrity of Chemical Sewer System</u>

This subsection discusses the integrity of the chemical sewer system as documented in the available file material.

According to a *Chemical Sewer Investigation*, dated September 1983, investigation of the chemical sewer stated that many defects were present within the piping system and structures comprising the chemical sewer and its branches. Defects identified included misaligned and open joints in the piping system (indicating a potential for exfiltration), as well as cracked and broken pipe in many locations. Some of the manhole structures were also found to be in poor condition. The results of the exfiltration hydrostatic test suggested a potential for leakage from the system. The report states that although some leakage could be expected from all piping systems constructed of similar materials utilized in the chemical sewer, the leakage from this particular system was felt to be higher than normal. An inspection of the connections to the chemical sewer and its branches found many locations where exfiltration could occur. Significant deterioration of discharge troughs, traps, and connections were evident, providing locations where direct exfiltration could occur (PAS-00001735). The potential daily total of exfiltration for the entire chemical sewer system was estimated to be 80,400 gallons per day (PAS-00001746). The location where the majority of leakage was occurring was along the

main branch of the chemical sewer and the branch starting at manhole No. 11. These two piping systems were estimated to contribute over 75% of the exfiltration in the system while comprising only 65% of the total length of the system (PAS-00001747).

Explosions in the chemical sewer were reported in 1973, 1980, and twice in 1982 (PAP-00181228-29).

Sewer Sampling Data

According to a letter prepared by NJDEP, dated August 27, 1984, Givaudan planned construction of new chemical sewer lines at the site as soon as an assessment stated the presence or absence of TCDD contamination along the proposed sewer line. All samples showed non-detectable levels of TCDD with the exception of four samples with concentrations ranging from 0.095 ppb to 0.398 ppb (PAP-00183328). According to the letter, these values were below the residential action level of 1 ppb so NJDEP authorized Givaudan to proceed with construction of the chemical sewer line (PAP-00183329).

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line were removed from the site for disposal at off-site disposal facilities. Post-excavation samples were collected from the sewer line excavations at the frequency of one per 30 linear feet from the sidewall of the excavation, and one per 50 linear feet from the base of the excavation (PAS-00033755, 87). 2,4,5-TCP was detected in post-excavation soil samples at concentrations ranging from 62,000 micrograms per kilogram (µg/kg) to 290,000 µg/kg. In addition, high molecular weight PAHs were detected in post-excavation soil samples collected along the sewer lines, along with the following OU2 COCs (PAS-00033862-84):

Range of Concentrations of OU2 COCs Detected in Post-Excavation Soil Samples along the Sewer Lines		
COC	**Minimum Detected Concentration (mg/kg)**	**Maximum Detected Concentration (mg/kg)**
Copper	660	53,000
Lead	440	92,000
Mercury	15	130

In addition to the sewer lines, excavation was conducted in areas of subsurface features identified during sewer decommissioning activities such as cesspools and tanks (PAS-00033781-82). In the area of the former cesspools, lead was detected at a concentration of 19,000 mg/kg and copper was detected at a concentration of 53,000 mg/kg (the sample depth was not reported) (PAS-00033854, 85).

Spent Acid Pit

According to a Givaudan document titled *Recovery of G-11 from Sediment in Sewer Ditch,* dated August 27, 1951, sediment had collected in "the pond." Individual samples of sediment from various locations in the pond, as well as representative samples of the

whole pond, were collected and found to consist of principally G-11® (HCP) and inorganic matter (e.g., sand, “filtercel,” grit, and calcium salts). Representative samples of the sediment yielded 60% “G-11 Pure” (based on the dry solid content of the sediment). The G-11® content was not uniform over the whole pond. The solids near the west end of the pond were approximately 70% G-11®, while the G-11® content near the middle and east end of the pond was about 50% G-11® (PAP-00183732). The referenced document does not identify the name of the pond; however, according to Givaudan’s November 10, 2016, Supplemental Response to 104(e) Request for Information, documentation states that prior to 1947, waste was discharged onsite into cesspools and pits. Further, a 1951 Givaudan memo discusses the recovery of HCP from the former waste pits, which also supports the facility's practice of discharging and handling its process waste water from HCP on site before the plant connected to the city sewer line on River Road by 1951-52 (PAS-00048078-79).

Stormwater Pond

As discussed in the previous subsection, surface water run-off from the site was discharged to an on-site stormwater pond (PAP-00183367).

According to a *Status Report, Remedial Investigation, TCDD Contamination Non-Process Area*, dated November 15, 1984, in July 1984, a composite of the liquid and a bottom sediment sample were obtained from the stormwater pond for analysis as part of the remedial investigation for TCDD contamination at the site. No TCDD “was present” in the pond sediment sample nor in liquid from the pond itself (PAP-00183454-58). Concentration data were not included in the referenced document.

According to a *Remedial Action Report for Sewer Decommissioning*, dated February 2000, lead (1,500 mg/kg), copper (1,100 mg/kg), and mercury (23 mg/kg) were detected in a sample collected from the stormwater pond, along with high molecular weight PAHs, in 1998/1999 (PAS-00033887-88).

Building Interior

According to an *Administrative Consent Order*, dated March 5, 1987, on July 9, 1983, Givaudan conducted a TCDD sampling program including sweep and wipe sampling of the interiors of buildings on portions of the site where HCP or 2,4,5-TCP were being or had been manufactured. Of the 31 samples analyzed, TCDD was present in detectable concentrations in 20 samples. Of those 20 samples, nine chip samples had TCDD concentrations of less than 1 ppb, four had TCDD concentrations between 1.0 ppb and 7.0 ppb, one chip sample had TCDD present in excess of 7.0 ppb (in Building 54 where TCP was believed to have been manufactured), and six wipe samples had TCDD concentrations of between 1.0 and 7.0 nanograms per square foot (PAS-00001809).

According to a letter prepared by Givaudan, dated March 29, 1996, five wipe samples also were collected from Building 54 for TCDD analysis in 1996. The maximum concentration detected was 373 nanograms per square meter (PAP-00172551-52).

Soil

This subsection is divided into a discussion of TCDD characterization activities at the site, and site characterization activities for all other OU2 COCs.

TCDD Characterization

Givaudan entered into an *Administrative Consent Order* with NJDEP on March 5, 1987; an *Amended Administrative Consent Order TCDD* was signed on February 16, 1988. These consent orders required the investigation and remediation of TCDD contamination in soil (PAS-00001767-73). It is noted that NJDEP originally established a 1.0 ppb action level and 7.0 ppb cleanup goal for TCDD; a site-specific cleanup goal of 20.0 ppb was established in the early 1990s (PAP-00179704). Therefore, the referenced documents summarized below often refer to TCDD concentrations relative to these concentration targets. It appears that subsequently, a remedial action objective of 2.0 ppb for TCDD-impacted soils from zero to 12 feet bgs was established in 1999 (PAP-00180350).

According to the *Administrative Consent Order*, dated March 5, 1987, on June 3, 1983, Givaudan agreed to conduct a sampling program designed to ascertain the presence or absence of TCDD in or on the soils, waters, equipment and/or structures at the site. Givaudan reported to NJDEP that the analyses of 15 out of 22 samples collected stated the presence of TCDD in detectable concentrations. Of those 15 samples, six had concentrations of less than 1.0 ppb, eight had concentrations between 1.0 ppb and 7.0 ppb, and one had a TCDD concentration in excess of 7.0 ppb. All samples whose analysis stated the presence of TCDD in concentrations over 1.0 ppb were collected in the area of the site where HCP had been manufactured (referred to as the "Contaminated Process Area"). No TCDD was detected in samples collected off site (PAS-00001808-10).

According to the 1990 NIOSH Report, Givaudan collected soil samples in the vicinity of the main HCP production building on approximately June 14, 1983. Results from 12 samples had TCDD concentrations ranging from 0.94 ppb to 11 ppb (PAP-00170554).

According to the *Administrative Consent Order*, dated March 5, 1987, on June 18 and 25, 1983, Givaudan conducted TCDD sampling at the site. Of the 41 samples collected, 25 had TCDD contamination in detectable concentrations. Of those 25 samples, 13 had TCDD concentrations less than 1.0 ppb, 11 had TCDD concentrations between 1.0 ppb and 7.0 ppb, and one sample had TCDD present in excess of 7.0 ppb (PAS-00001809).

According to a *Status Report, Remedial Investigation, TCDD Contamination Non-Process Area*, dated November 15, 1984, in July 1984, soil sampling was conducted around the stormwater pond as part of the remedial investigation for TCDD contamination at the site (PAP-00183454-58). TCDD contamination in soils around the stormwater pond existed at a number of locations and to depths of 12 inches bgs (PAP-00183458). TCDD concentrations in excess of 1.0 ppb were encountered at four borings in the vicinity of the stormwater pond. TCDD was present in the surface sample

in two of these borings and to a depth of 12 inches bgs in the other two borings at concentrations ranging up to 16.89 ppb (PAP-00183457).

According to the *Administrative Consent Order*, dated March 5, 1987, during the course of a TCDD sampling program conducted by Givaudan and U.S. EPA through July 30, 1985, a total of 402 samples were analyzed for TCDD. Findings were as follows:

- All samples analyzed as having TCDD contamination in concentrations of 1.0 ppb or more were located in the "Contaminated Process or Contaminated Non-Process Areas."

- Twenty-six samples were collected and analyzed by U.S. EPA in the area surrounding the site, all of which were analyzed as containing no TCDD contamination at concentrations of 1.0 ppb or more.

- Three hundred twenty-nine samples were collected and analyzed by Givaudan outside the buildings located on the site, 255 of which were analyzed as containing no TCDD contamination in concentrations of 1.0 ppb or more, 51 of which were analyzed as having TCDD contamination in concentrations between 1.0 ppb and 7.0 ppb, and 23 of which were analyzed as having TCDD contamination in excess of 7.0 ppb.

- Forty-seven samples were collected and analyzed at various locations inside the buildings located on the site, six of which were analyzed as having TCDD contamination at concentrations of 1 nanogram per square foot or more (none of which were analyzed as having TCDD contamination in concentrations in excess of 7 nanograms per square foot) and 41 of which were analyzed as having no TCDD contamination in concentrations of 1 nanogram per square foot or less (PAS-00001812).

Between 1988 and 1989, field investigations were conducted at the site to delineate the presence and extent of TCDD contamination to partially fulfill the March 1987 *Administrative Consent Order*. The investigation concluded that soils impacted by TCDD were confined to the upper 24 inches of the soil profile (PAS-00106329-30).

According to a *Draft TCDD Feasibility Study Report*, dated March 16, 1992, based on the results of the comprehensive site investigation, two areas of potential concern were identified: the Contaminated Process Area and the Contaminated Non-Process Area. The area consisting primarily of buildings formerly used for the manufacture of chemicals and some immediately-adjacent soils was designated as the Contaminated Process Area, while the Contaminated Non-Process Area was comprised of three distinct sub-areas which were identified as former drum storage locations. It was believed that the residual TCDD contamination present in the soil profile was a result of inadvertent spills and leaks originating from the drums (PAP-00179682). The locations of the Contaminated Process Area and Contaminated Non-Process Area are depicted in **Appendix B-7**. At the Contaminated Process Areas, with the exception of one sample, the vertical extent of TCDD contamination was limited to the upper 18 inches bgs of the

soil profile within the area (PAP-00179699-700). The deepest TCDD contaminated soils found were at 10 to 12 inches bgs at Contaminated Non-Process Areas A and B. The deepest TCDD contaminated soils found were at 12 to 18 inches bgs at Contaminated Non-Process Area C. Sample data collected in 1988 and 1989 for TCDD and as discussed in the report were as follows:

- On May 21-22, 1988, 46 samples collected in the Contaminated Non-Process Area were analyzed for TCDD. Of these 46 samples, 36 samples demonstrated the presence of TCDD at concentrations less than 1.0 ppb, eight samples demonstrated the presence of TCDD concentrations in the range of 1.0 ppb to 7.0 ppb, and two samples had TCDD concentrations greater than 7.0 ppb (PAP-00179696).

- Of 80 samples collected at the Contaminated Non-Process Area on November 19, 1988, 57 samples (71 percent) had TCDD concentrations below 1.0 ppb, 19 samples (24 percent) had TCDD concentrations ranging from 1.0 ppb to less than 7.0 ppb, and four samples (5 percent) had TCDD concentrations in excess of 7.0 ppb (PAP-00179696, 98).

- Of the 65 samples collected on March 18, 1989 at the Contaminated Non-Process Area, 33 samples (51 percent) had TCDD concentrations below 1.0 ppb, 28 samples (43 percent) had TCDD concentrations ranging from 1.0 to less than 7.0 ppb, and 4 samples (6 percent) had TCDD concentrations in excess of 7.0 ppb (PAP-00179698).

- On 18 March 1989, 18 additional soil samples, and three Building 54 samples (located above the chemical sewer line) were collected from the Contaminated Process Area. Of the 16 soil samples analyzed, six samples had TCDD concentrations below 1.0 ppb, 10 samples had TCDD concentrations ranging from 1.0 to 7.0 ppb, and two samples had TCDD concentrations in excess of 7.0 ppb (PAP-00179698).

To summarize the historical data described above, the *Draft TCDD Feasibility Study Report*, dated March 16, 1992, stated that between 1983 and 1990, eight soil samples had been collected at the site with concentrations greater than the site-specific cleanup goal of 20.0 ppb TCDD; concentrations of these eight samples ranged from 22 ppb to a maximum of 200 ppb. Sample depths ranged from zero to 12 inches bgs. The volume of soil containing greater than 20.0 ppb TCDD was calculated to be approximately 12,400 cubic feet (PAP-00179717-18).

According to a *Remedial Action Report for 2,3,7,8-TCDD Excavation and Disposal*, dated September 2000, a remedial action objective for TCDD-impacted soils at the site was the removal of TCDD-impacted soils having concentrations greater than 2.0 ppb in the 0 to 12-foot bgs soil profile (PAP-00180350). Additional sampling for TCDD was conducted in areas identified as past drum storage areas at the site. In addition, areas of suspected TCDD contamination, which were identified during previous site investigations, but could not be sampled due to production operations in the buildings,

were sampled (PAP-00180351). The maximum detected TCDD concentration was 18.79 ppb at five to six feet bgs. In the surface soil interval (zero to two feet, at original grade), TCDD concentrations ranged from 0.012 ppb to 16.2 E ppb (the "E" states the concentration of TCDD exceeds the upper end of the method's calibration curve (PAP-00180358, 81).

The location of the drum storage area is depicted in **Appendix B-8**.

Other OU2 COCs

According to the *Remedial Investigation Report for Soils*, dated October 1997, the remedial investigation was completed in three phases. The initial phase was conducted during the period from February 26, 1996 to March 8, 1996, and consisted of the installation of 88 soil borings. Based on the findings of the initial phase, 10 additional soil borings were installed in the investigation areas during a supplemental investigation implemented in May 1996 to further delineate the horizontal and vertical extent of impacted soil. On October 28, 1996, two soil borings were installed during a Supplemental Soil Investigation conducted to complete the delineation of the perimeter of the site (PAP-00182317). The following are the maximum detected concentrations of COCs in soil, along with the depths at which the maximum detected concentrations were detected and the locations (PAP-00182344):

Maximum Detected Concentrations of COCs in Soil Reported in *Remedial Investigation Report for Soils*, dated October 1997			
COC	**Concentration (mg/kg)**	**Depth**	**Location of Maximum Detected Concentration**
Copper	1,800	10-12 feet bgs	Chemical Sewer
Lead	4,800	10-12 feet bgs	Former Spent Acid Pit
Mercury	35	10-12 feet bgs	Chemical Sewer

High molecular weight PAHs were also detected with maximum concentrations reported in the 10 to 12-foot bgs depth interval at the drum storage area and warehouse (PAP-00182319, 29, 41-47). 2,4,5-TCP was detected at the 10 to 12-foot bgs depth interval at the drum storage area at a concentration of 170,000 µg/kg (PAP-00182342). Noting that maximum detected concentrations were in deep subsurface soil, the following concentrations of OU2 COCs were also reported for surface soil: lead (1,900 mg/kg) and mercury (17 mg/kg) in a sample collected from zero to two feet bgs in the area of the chemical sewer (PAP-00182344).

Remedial Activities

According to a letter prepared by NJDEP, dated December 17, 1991, NJDEP originally determined that a site-specific TCDD soil cleanup level of 20.0 ppb was acceptable for the site (PAP-00170898). According to a letter prepared by Givaudan, dated April 25, 1991, the volume of soil in the Contaminated Process and Contaminated Non-Process areas with TCDD concentrations in excess of 7.0 ppb was estimated to be 900 cubic

yards. The volume of soil in the Contaminated Process and Contaminated Non-Process areas with TCDD concentrations in excess of 20.0 ppb was estimated to be 510 cubic yards (PAP-00170773). According to the *Draft TCDD Feasibility Study Report*, dated March 16, 1992, the areal extent of soils containing TCDD greater than 1.0 ppb was calculated to be approximately 101,700 square feet. The volume of soil containing greater than 1.0 ppb but less than or equal to 20.0 ppb TCDD was calculated to be approximately 7,100 cubic yards. In addition to this volume of soil,128 55-gallon drums of soil removed from north of Building 68 were classified as greater than 1.0 ppb but less than or equal to 20.0 ppb TCDD (PAP-00179717-19).

According to a letter prepared by Givaudan, dated February 27, 1995, in February 1988, TCDD-contaminated soil was excavated to a concentration of 1 ppb, and placed in 128 drums (PAP-00172020). According to the October 1999 Remedial Action Report for On-Site Containment of 2,3,7,8-TCDD-Impacted Soils, the soil from these drums, in addition to soils above 1 u/g/kg TCDD excavated from Work Areas, was placed in the onsite containment cell (PAP-00345774).

According to a *Remedial Action Report for Sewer Decommissioning*, prepared for Givaudan, dated February 2000, over 11,000 lineal feet of chemical sewer and storm sewer line, five underground storage tanks, four cesspools, miscellaneous features such as manholes, catch basins, and 15,600 tons of impacted soils were removed from the site for disposal at off-site disposal facilities. In addition, the stormwater pond was taken out of service (including removal of 135,000 gallons of water) and underlying soils were removed, and 2,558 tons of asphalt from paved areas in the plant were removed and sent offsite for disposal. Soils not suitable for reuse were sent offsite for recycling. Concrete from the demolished buildings and various storage pads were crushed, sampled, and reused onsite as backfill, and for rough grading of the property (PAS-00033755; PAP-00168968-69). This work was conducted as part of an ISRA remediation after the plant was closed (PAP-00180344).

According to a *Documentation of Environmental Indicator Determination*, prepared on behalf of U.S. EPA, dated September 29, 2008, 610 tons of soil containing TCDD above the subsequent NJDEP-approved cleanup level of 2.0 ppb was excavated and incinerated offsite (PAP-00168968; PAP-00180360). Note: This work was conducted as part of an ISRA remediation after the plant was closed. The document states that the selected remedy for soils incorporated the installation of a low-permeability asphalt cover over the majority of the site, construction of warehouses, installation of a fence around the perimeter of the site, and recording of a deed notice to restrict future uses of the property (PAP-00168962). This remedy was approved by NJDEP in a letter dated June 21, 2000, and was subsequently implemented by Givaudan as part of the site redevelopment process. The deed notice for the northern parcel of the site restricted the entire site to non-residential use and was recorded on June 29, 1999. The document goes on to state that the soil containing TCDD at concentrations less than 2.0 ppb was managed in an engineered containment cell near the southern end of the site. Givaudan retained ownership of this southern parcel and placed a deed restriction on this site in 1999 (PAP-00168972).

A figure depicting TCDD-impacted areas is presented in **Appendix B-9**.

On March 12, 2002, NJDEP issued a “no further action” letter for soils containing TCDD, which included the site use restrictions (PAS-00106564-66).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Appendix A

Data Report Tables

Appendix A-1	
Hexachlorophene Production Volume	
Year	**Pounds Produced**
1947	42,000
1948	100,000
1949	500,000
1950	500,000-1,000,000
1951	1,000,000
1952	500,000-1,000,000
1953	1,000,000
1954	1,000,000
1955	1,500,000
1956	1,500,000-2,000,000
1957	1,000,000
1958	500,000
1959	500,000-1,000,000
1960	1,000,000
1961	1,000,000
1962	1,500,000
1963	1,500,000
1964	2,000,000
1965	2,500,000
1966	2,000,000-2,500,000
1967	2,000,000-2,500,000
1968	3,000,000
1969	3,000,000-3,500,000
1970	3,000,000
1971	3,000,000-3,500,000
1972	1,000,000
1973	150,000
1974	200,000
1975	100,000
1976	500,000
1977	500,000
1978	100,000-500,000
1979	100,000-500,000
1980	100,000-500,000
1981	100,000-500,000
1982	100,000
1983	100,000-500,000
1984	17,000

Source: PAP-00170561

Appendix A-2			
TCDD Concentrations Detected in 2,4,5-TCP Feedstock			
Source of 2,4,5-TCP	**Date of Analytical Report**	**Number of 2,4,5-TCP Samples Analyzed**	**Maximum 2,3,7,8-TCDD Concentration Detected (or maximum reporting limit if not detected)**
Hooker Chemical	10/27/1970	3	Non-detect at 50 ppb (<50 ppb)
Hooker Chemical	3/12/1971	2	Non-detect at 10 ppb (<10 ppb)
Hooker Chemical	3/12/1971	2	Non-detect at 1,000 ppb (<1,000 ppb)
"Italian TCP"	8/26/1976	24	83 ppb
ICMESA	9/9/1976	3	14 ppb
ICMESA	11/26/1976	3	14 ppb
Dow	8/1977 to 12/1977	3	3 ppb
Dow	10/1976 to 12/1978	44	Non-detect at 10 ppb (<10 ppb)
Dow	6/24/1983	3	3 ppb
Celamerck	8/1978 to 3/1983	58	Non-detect at 10 ppb (<10 ppb)
Celamerck	8/1978 to 3/1983	6	Non-detect at 5 ppb (<5 ppb)
Celamerck	6/24/1983	8	Non-detect at 1 ppb (<1 ppb)
Linz	3/24/1983	8	Non-detect at 5 ppb (<5 ppb)
Linz	6/24/1983	2	2.9 ppb

Source: PAP-00170564; PAP-00182230; PAP-00183644; PAP-00182230; PAS-00084001; PAP-00185309

Appendix A-3

TCDD Concentrations in Hexachlorophene

Date of Analytical Report	Number of Hexachlorophene Samples Analyzed	Range of 2,3,7,8-TCDD Concentrations Detected (or maximum reporting limit if not detected)
6/8/1970	5	Non-detect at 30 ppb (<30 ppb)
7/7/1970	6	Non-detect at 20 ppb (<20 ppb)
10/27/1970	8	Non-detect at 50 ppb (<50 ppb)
10/27/1970	1	Non-detect at 100 ppb (<100 ppb)
3/12/1971	1	Non-detect at 100 ppb (<100 ppb)
1/1976 to 10/1977	212	193 samples non-detect at 1 ppb (<1ppb) 2 samples non-detect at 2 ppb (<2ppb) 17 samples between 1.5 and 4 ppb
9/9/1976	2	Non-detect at 2 ppb <2 ppb to 5.2 ppb

Source: PAP-00170567; PAP-00182230; PAP-00183549-63; PAP-00182227

Appendix A-4			
Summary of Wastewater Discharge Data			
Date	Outfall	Volume Discharged (in gallons, unless otherwise noted)	Source
1979	Not listed	724,000,000	PAS-00035835
1988 to 1992	001	210,481,000 gallons/year	PAP-00171798
March 1994	001	13,725,000	PAP-00171757
March 1994	003	1,620,580	PAP-00171759
January 1995	001	7,905,000	PAS-00036536
January 1995	002	29, 260	PAS-00036537
January 1995	003	1,912,120	PAS-00036538
January 1995	004	22,750	PAS-00036539
March 1995	001	9, 035,000	PAS-00036655
March 1995	002	37, 290	PAS-00036656
March 1995	003	854,320	PAS-00036657
April 1995	001	7,926, 000	PAS-00036675
April 1995	002	74,290	PAS-00036676
April 1995	003	2,093,510	PAS-00036677
May 1995	001	8,721,000	PAS-00036698
May 1995	002	83,430	PAS-00036699
May 1995	003	1,442,320	PAS-00036700
June 1995	001	9,059,000	PAS-00036719
June 1995	002	118,910	PAS-00036720
June 1995	003	2,002,990	PAS-00036721
July 1995	001	8,089,000	PAS-00036739
July 1995	002	159,650	PAS-00036740
July 1995	003	2,797,530	PAS-00036741
August 1995	001	10,906,000	PAS-00036780
August 1995	002	157,580	PAP-00172205
August 1995	003	2,922,870	PAP-00172206
September 1995	001	9,542,000	PAS-00036800
September 1995	002	119,080	PAP-00172203
September 1995	003	2,436,490	PAP-00172204
October 1995	001	4,598,000	PAP-00172214
October 1995	002	64,960	PAP-00172213
October 1995	003	2,369,950	PAP-00172212
November 1995	001	5,613,000	PAS-00036866
November 1995	002	45,190	PAS-00036867
November 1995	003	1,764,520	PAS-00036868
December 1995	001	4,982,000	PAS-00036886
December 1995	002	77,020	PAS-00036887
December 1995	003	1,456,820	PAS-00036888
January 1996	001	6,514,000	PAS-00036911
January 1996	002	37,820	PAS-00036912
January 1996	003	1,499,510	PAS-00036913
February 1996	001	6,910,000	PAS-00036935

Appendix A-4			
Summary of Wastewater Discharge Data			
Date	Outfall	Volume Discharged (in gallons, unless otherwise noted)	Source
February 1996	002	14,420	PAS-00036936
February 1996	003	539,760	PAS-00036937
March 1996	001	6,449,000	PAS-00036956
March 1996	002	19,430	PAS-00036958
March 1996	003	960,760	PAS-00036960
April 1996	001	6,883,000	PAS-00036975
April 1996	002	21,700	PAS-00036976
April 1996	003	464,290	PAS-00036977
May 1996	001	7,473,000	PAS-00036995
May 1996	002	35,380	PAS-00036996
May 1996	003	576,430	PAS-00036997
June 1996	001	9,163,000	PAS-00037014
June 1996	002	80,450	PAS-00037015
June 1996	003	1,450,880	PAS-00037016
July 1996	001	9,065,000	PAP-00172792
August 1996	001	10,160,000	PAP-00173139
August 1996	002	176,040	PAP-00173140
August 1996	003	2,920,800	PAP-00173141
September 1996	001	8,427,000	PAP-00173136
September 1996	002	138,160	PAP-00173137
September 1996	003	2,501,800	PAP-00173138
October 1996	001	7,172,000	PAP-00173123
October 1996	002	100,970	PAP-00173134
October 1996	003	1,547,640	PAP-00173135
November 1996	001	5,204,000	PAP-00173204
November 1996	002	77,000	PAP-00173583
November 1996	003	1,263,320	PAP-00173584
December 1996	001	4,978,000	PAP-00173265
December 1996	002	52,130	PAP-00173580
December 1996	003	1,057,760	PAP-00173581
January 1997	001	4,943,000	PAP-00173358
January 1997	002	21,770	PAP-00173577
January 1997	003	859,160	PAP-00173578
February 1997	001	4,440,000	PAP-00173445
February 1997	002	33,750	PAP-00173574
February 1997	003	732,650	PAP-00173575
March 1997	001	4,784,000	PAP-00173520
March 1997	002	69,940	PAP-00173571
March 1997	003	747,720	PAP-00173572
April 1997	001	5,818,000	PAP-00173558
April 1997	002	51,480	PAP-00173568
April 1997	003	905,930	PAP-00173569

Appendix A-4			
Summary of Wastewater Discharge Data			
Date	**Outfall**	**Volume Discharged (in gallons, unless otherwise noted)**	**Source**
May 1997	001	6,300,000	PAP-00173621
May 1997	002	54,350	PAP-00173706
May 1997	003	1,256,900	PAP-00173707
June 1997	001	8,242,000	PAP-00173624
June 1997	002	129,630	PAP-00173703
June 1997	003	2,059,100	PAP-00173704
July 1997	001	9,128,000	PAP-00173674
July 1997	002	164,620	PAP-00173700
July 1997	003	2,855,100	PAP-00173701
August 1997	001	7,433,000	PAP-00173693
August 1997	002	190,220	PAP-00173694
August 1997	003	2,258,710	PAP-00173695
September 1997	001	7,587,000	PAP-00173708
October 1997	001	6,985,000	PAP-00173772
November 1997	001	5,764,000	PAP-00173817
December 1997	001	5,275,000	PAP-00173866
January 1998	001	6,362,000	PAP-00173921
March 1998	001	7,115,000	PAP-00173972
March 1998	002	51,220	PAP-00173967
August 1998	001	4,614,000	PAP-00174379
August 1998	002	117,910	PAP-00174381
August 1998	003	2,290,100	PAP-00174383
October 1998	001	529,000	PAP-00174923
October 1998	002	10,600	PAP-00174924
October 1998	003	766,000	PAP-00174925
November 1998	001	0	PAP-00174920
November 1998	002	66,680	PAP-00174921
November 1998	003	1,505,670	PAP-00174922

Appendix A-5				
Peak Stormwater Runoff Rates in 1993				
Stormwater Discharge Point Number and Name	**Stormwater Source Description**	**Ultimate Stormwater Discharge Point**	**Acres Drained**	**Peak Rate of Runoff - 25-Year Storm (gallons per minute)**
1 - NW Corner	Sheet flow into Delawanna Avenue gutter	Third River	0.062	49
2 - Building 9	Building 9 roof drainage into storm sewer in Delawanna Avenue	Third River	0.577	1,776
3 - Guard House	Sheet flow into Delawanna Avenue gutter	Third River	0.213	655
4 - NJDOT Inlet	Stormwater runoff collected via swales and pipes from southeastern portion of site into stormsewer in River Road	Passaic River	6.249	12,701
5 - SW Curb Cut	Sheet flow and gutter flow from southern portion of site and south of Building 95 into River Road gutter	Third River	3.306	8,356
6 - Railroad Curb Cut	Stormwater runoff collected via swales and pipes from southeastern portion of site into stormsewer in River Road	Third River	2.945	5,292
5 + 6 - Curb Cut	Not available	Not available	3.251	10,686

Source: PAP-00178571, 77-80

Note: Storm water runoff rates were calculated after the site was paved in 1983. Prior to that date, the Clifton Site was not paved and storm water infiltrated into the site soils and / or was directed to the on-site storm water pond (PAS-00048098).

Appendix A-6

Mass/Concentration of Copper, Lead, and Mercury in Facility Wastewater

Date	Outfall	Copper		Lead		Mercury		Source
		Mass* (pounds/day)	Permit Limit* (average pounds/day)	Mass* (pounds/day)	Permit Limit* (average pounds/day)	Mass* (pounds/day)	Permit Limit* (average pounds/day)	
1975	N/A	10.5	N/A	3.5	N/A	Not Reported	Not Reported	PAS-00035828
1977	N/A	0.212 mg/L	N/A	0.776 mg/L	N/A	0.0038 mg/L	N/A	PAS-00035829
February 1994	001	Not Reported	Not Reported	0.03715	1.53899	Not Reported	Not Reported	PAP-00171264
March 1994	001	Not Reported	Not Reported	0.03029	1.53899	Not Reported	Not Reported	PAP-00171749
July 1994	001	Not Reported	Not Reported	0.01769	1.53899	Not Reported	Not Reported	PAP-00171872
September 1994	001	0.093 mg/L	N/A	0.011 mg/L	N/A	ND	N/A	PAS-00036812
September 1994	002	0.131 mg/L	N/A	0.023 mg/L	N/A	ND	N/A	PAS-00036813
November 1994	001	0.188 mg/L	0.092 mg/L	Not Reported	Not Reported	0.001 mg/L	0.001 mg/L	PAS-00036507
November 1994	002	0.105 mg/L	0.092 mg/L	0.464 mg/L	0.029 mg/L	ND	0.001 mg/L	PAS-00036508
December 1994	001	Not Reported	Not Reported	<0.02128	1.53899	Not Reported	Not Reported	PAS-00036442
January 1995	001	Not Reported	Not Reported	0.04038	1.53899	Not Reported	Not Reported	PAS-00036523
February 1995	001	Not Reported	Not Reported	<0.02015	1.53899	Not Reported	Not Reported	PAP-00172025
March 1995	001	Not Reported	Not Reported	0.02259	1.53899	Not Reported	Not Reported	PAS-00036643
April 1995	001	Not Reported	Not Reported	0.01915	1.53899	Not Reported	Not Reported	PAS-00036663
May 1995	001	Not Reported	Not Reported	0.05304	1.53899	Not Reported	Not Reported	PAS-00036685
June 1995	001	Not Reported	Not Reported	0.01576	1.53899	Not Reported	Not Reported	PAS-00036706
July 1995	001	Not Reported	Not Reported	0.02275	1.53899	Not Reported	Not Reported	PAS-00036727
August 1995	001	Not Reported	Not Reported	0.03615	1.53899	Not Reported	Not Reported	PAS-00036748
September 1995	001	Not Reported	Not Reported	0.03936	1.53899	Not Reported	Not Reported	PAS-00036788
October 1995	001	Not Reported	Not Reported	0.01771	1.53899	Not Reported	Not Reported	PAS-00036830
November 1995	001	Not Reported	Not Reported	0.02502	1.53899	Not Reported	Not Reported	PAS-00036853
December 1995	001	Not Reported	Not Reported	0.01337	1.53899	Not Reported	Not Reported	PAS-00036874
January 1996	001	Not Reported	Not Reported	0.01693	1.53899	Not Reported	Not Reported	PAP-00172254
February 1996	001	Not Reported	Not Reported	0.03247	1.53899	Not Reported	Not Reported	PAP-00172417
March 1996	001	Not Reported	Not Reported	0.08815	1.53899	Not Reported	Not Reported	PAP-00172462
May 1996	001	Not Reported	Not Reported	0.0211	1.53899	Not Reported	Not Reported	PAP-00172653
June 1996	001	Not Reported	Not Reported	0.03916	1.53899	Not Reported	Not Reported	PAP-00172667
November 1996	001	Not Reported	Not Reported	0.00941	1.53899	Not Reported	Not Reported	PAP-00173212
December 1996	001	Not Reported	Not Reported	0.00604	1.53899	Not Reported	Not Reported	PAP-00173274
February 1997	001	Not Reported	Not Reported	0.01898	1.53899	Not Reported	Not Reported	PAP-00173489
March 1997	001	Not Reported	Not Reported	<0.07506	1.53899	Not Reported	Not Reported	PAP-00173536
June 1997	001	Not Reported	Not Reported	0.01556	1.53899	Not Reported	Not Reported	PAP-00173648
June 1997	002	0.114 mg/L	3.02 mg/L	0.00791 mg/L	0.54 mg/L	0.0002 mg/L	0.08 mg/L	PAP-00173662
September 1997	001	0.0891 mg/L	0.092 mg/L	0.00776	1.53899	<0.00020	0.008 mg/L	PAP-00173719, 21
September 1997	002	0.125 mg/L	3.02 mg/L	0.00421 mg/L	0.54 mg/L	<0.00020	0.08 mg/L	PAP-00173738
October 1997	001	0.117 mg/L	3.02 mg/L	0.00368	1.53899	<0.00020 mg/L	0.08 mg/L	PAP-00173788, 94
October 1997	002	0.363 mg/L	3.02 mg/L	0.0422 mg/L	0.54 mg/L	0.00086 mg/L	0.08 mg/L	PAP-00173811
November 1997	001	0.0906 mg/L	3.02 mg/L	0.01242	1.5899	0.00267 mg/L	0.08 mg/L	PAP-00173834, 36
November 1997	002	0.072 mg/L	3.02 mg/L	0.00332 mg/L	0.54 mg/L	0.00031 mg/L	0.008 mg/L	PAP-00173857
December 1997	001	0.06140 mg/L	3.02 mg/L	0.00584	1.53899	ND	0.008 mg/L	PAS-00038351, 53
December 1997	002	0.0447 mg/L	3.02 mg/L	0.00410 mg/L	0.54 mg/L	Not Reported	Not Reported	PAS-00038375
January 1998	001	0.0606 mg/L	3.02 mg/L	0.02448	1.53899	<0.00020 mg/L	0.08 mg/L	PAP-00173939, 41
January 1998	002	0.0551 mg/L	3.02 mg/L	0.00304 mg/L	0.54 mg/L	Not Reported	Not Reported	PAP-00173965
February 1998	001	0.0607 mg/L	3.02 mg/L	0.00307	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174017, 19
February 1998	002	0.0212 mg/L	3.02 mg/L	0.00532 mg/L	0.54 mg/L	Not Reported	Not Reported	PAP-00174049
March 1998	001	0.0832 mg/L	3.02 mg/L	0.00545	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174071, 73
March 1998	002	0.02630 mg/L	3.02 mg/L	0.00106 mg/L	0.54 mg/L	<0.00020 mg/L	N/A	PAP-00174099
April 1998	001	0.14581 mg/L	3.02 mg/L	0.01082	1.53899	<0.00031 mg/L	0.008 mg/L	PAP-00174117, 19
May 1998	001	0.149 mg/L	3.02 mg/L	0.00865	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174141, 43
May 1998	002	0.043 mg/L	3.02 mg/L	0.00381	0.54 mg/L	<0.0002 mg/L	N/A	PAP-00174170
June 1998	001	0.222 mg/L	3.02 mg/L	0.0357	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174186, 88
June 1998	002	0.0339 mg/L	3.02 mg/L	0.00321 mg/L	0.54 mg/L	<0.00020 mg/L	N/A	PAP-00174189
July 1998	001	0.0808 mg/L	3.02 mg/L	0.00366	1.53899	<0.00020 mg/L	0.008 mg/L	PAP-00174292, 94
August 1998	001	0.09340 mg/L	N/A	0.005	1.53899	ND	N/A	PAS-00038198, 200
August 1998	002	0.0255 mg/L	3.02 mg/L	0.00225 mg/L	0.54 mg/L	<0.00020 mg/L	N/A	PAS-00038226
October 1998	001	0.21600 mg/L	3.02 mg/L	<0.00127	1.53899	0.00039 mg/L	0.08 mg/L	PAS-00038266, 68
October 1998	002	0.031 mg/L	3.02 mg/L	0.0032 mg/L	0.54 mg/L	<0.00020 mg/L	0.08 mg/L	PAS-00038301
November 1998	001	1.07 mg/L	3.02 mg/L	0.00628	1.53899	0.00024 mg/L	0.08 mg/L	PAS-00038316, 18
November 1998	002	0.0331 mg/L	3.02 mg/L	0.00338 mg/L	0.54 mg/L	<0.00020 mg/L	0.08 mg/L	PAS-00038309

*Data reported in pounds per day unless otherwise noted.

Data reported in mg/L are shaded in blue to distinguish them from those data in pounds/day.

mg/L = milligrams per liter

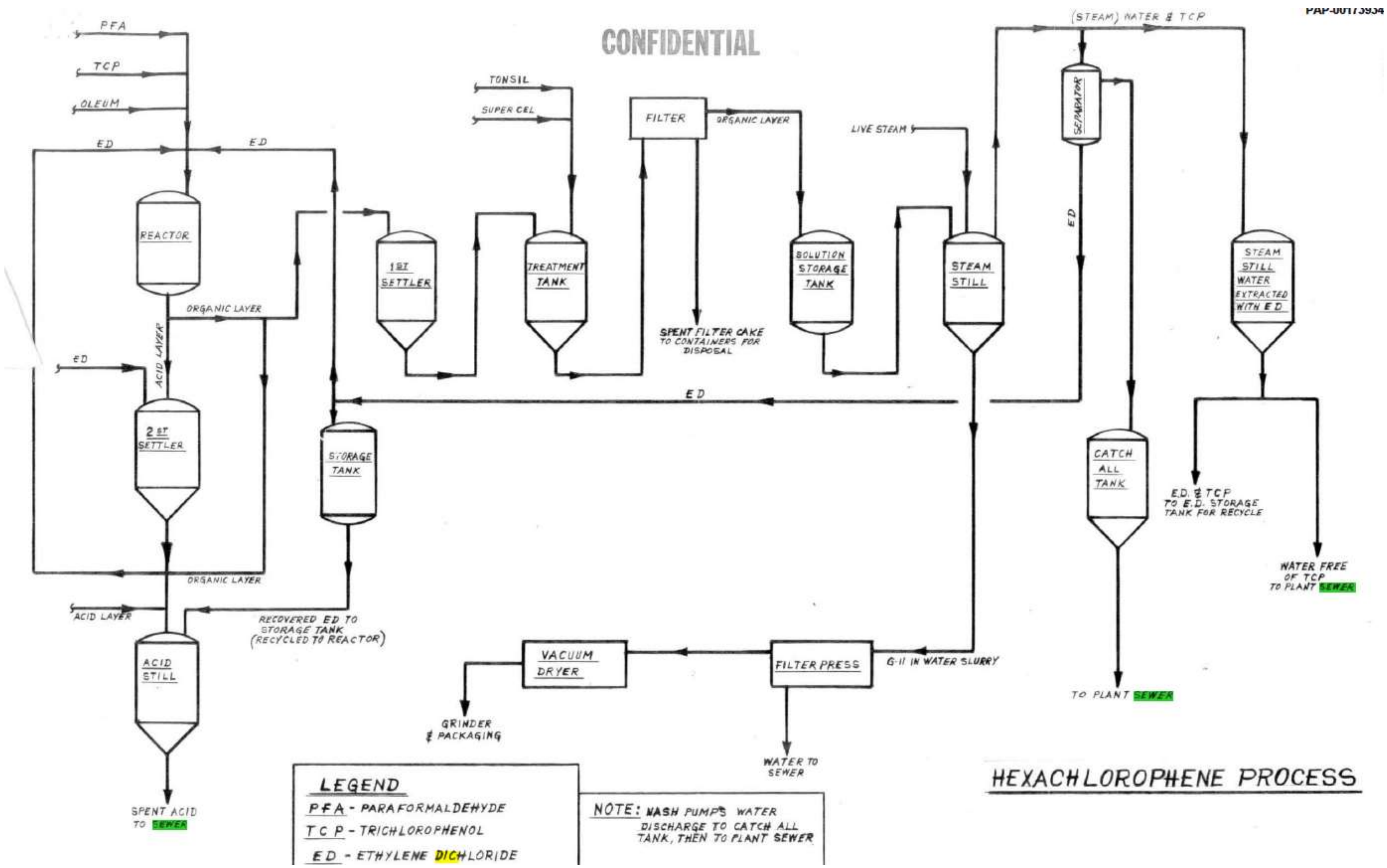
N/A = Not available

ND = Not detected

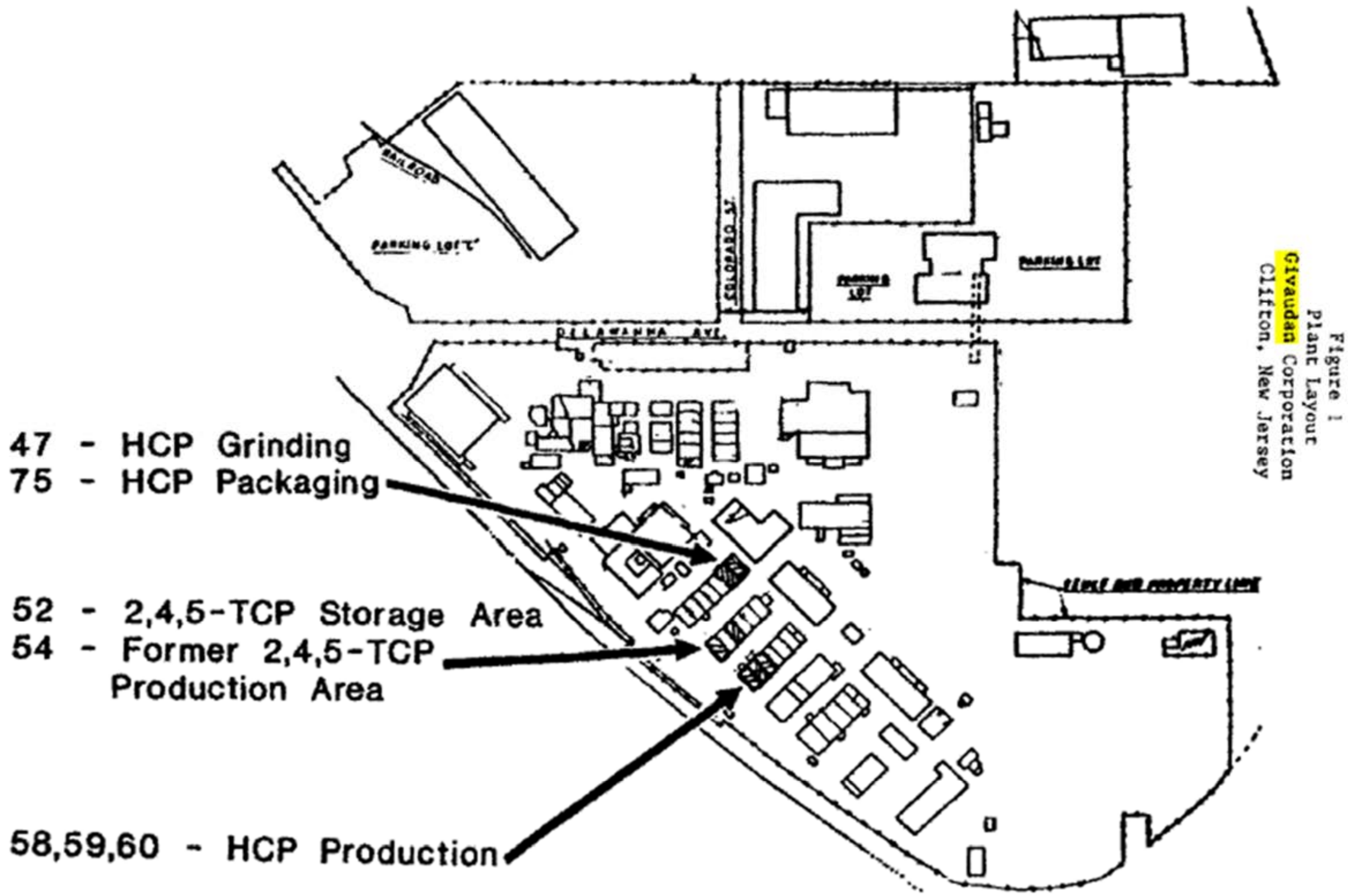
Appendix B

Data Report Figures

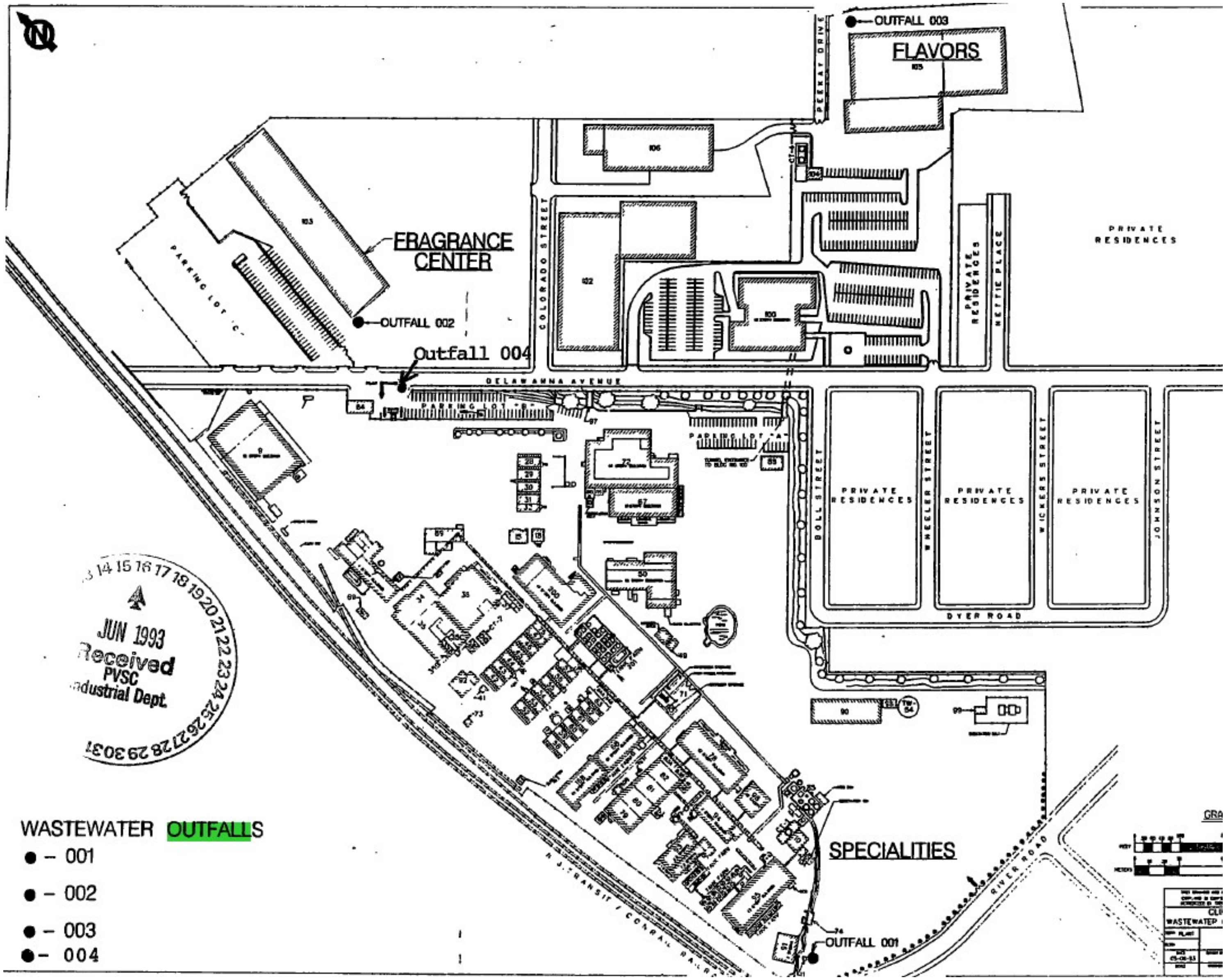
Appendix B-1. Flow diagram outlining the HCP manufacturing process (PAP-00173934).



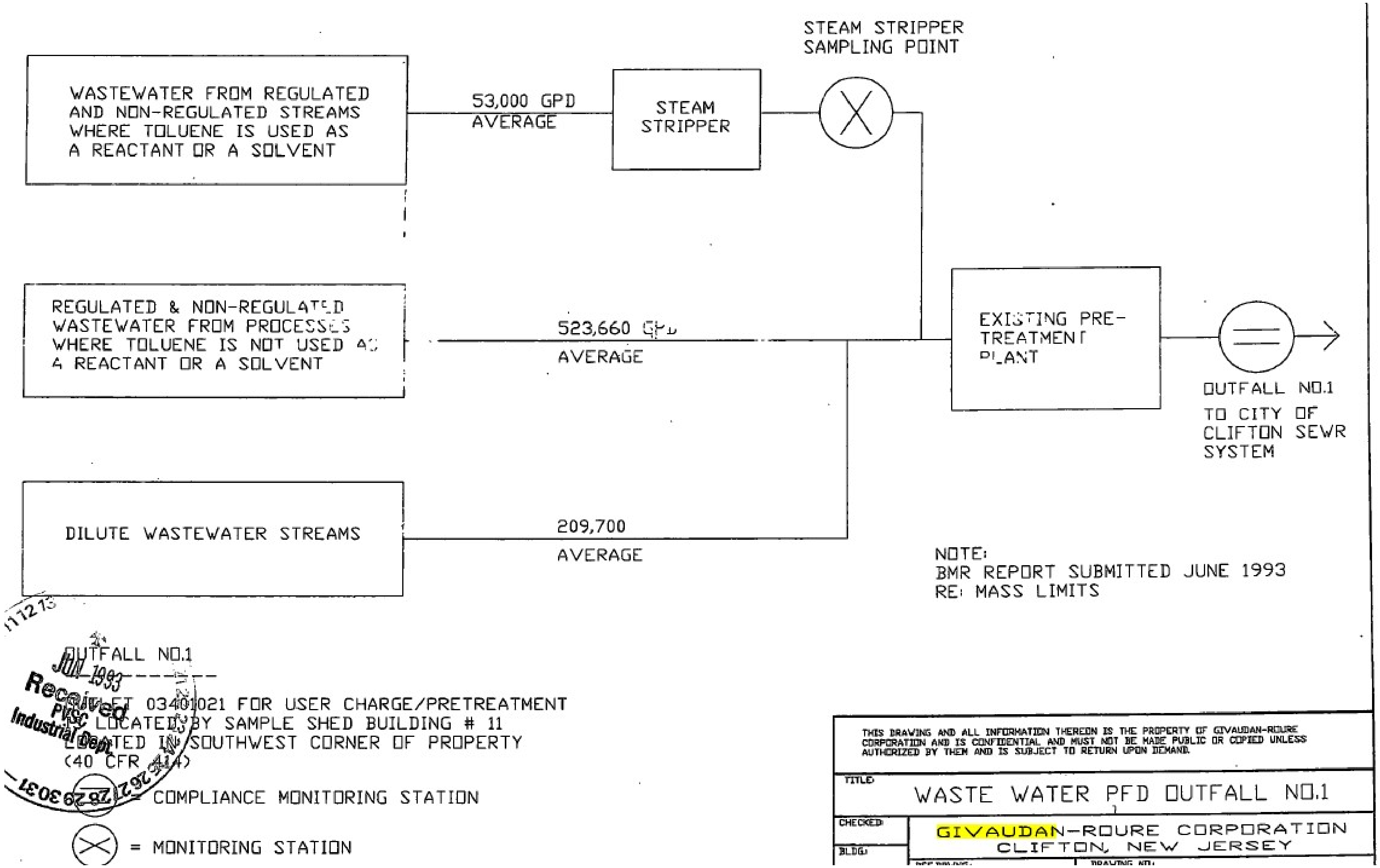
Appendix B-2. HCP and 2,4,5-TCP storage and production areas (PAP-00170572).

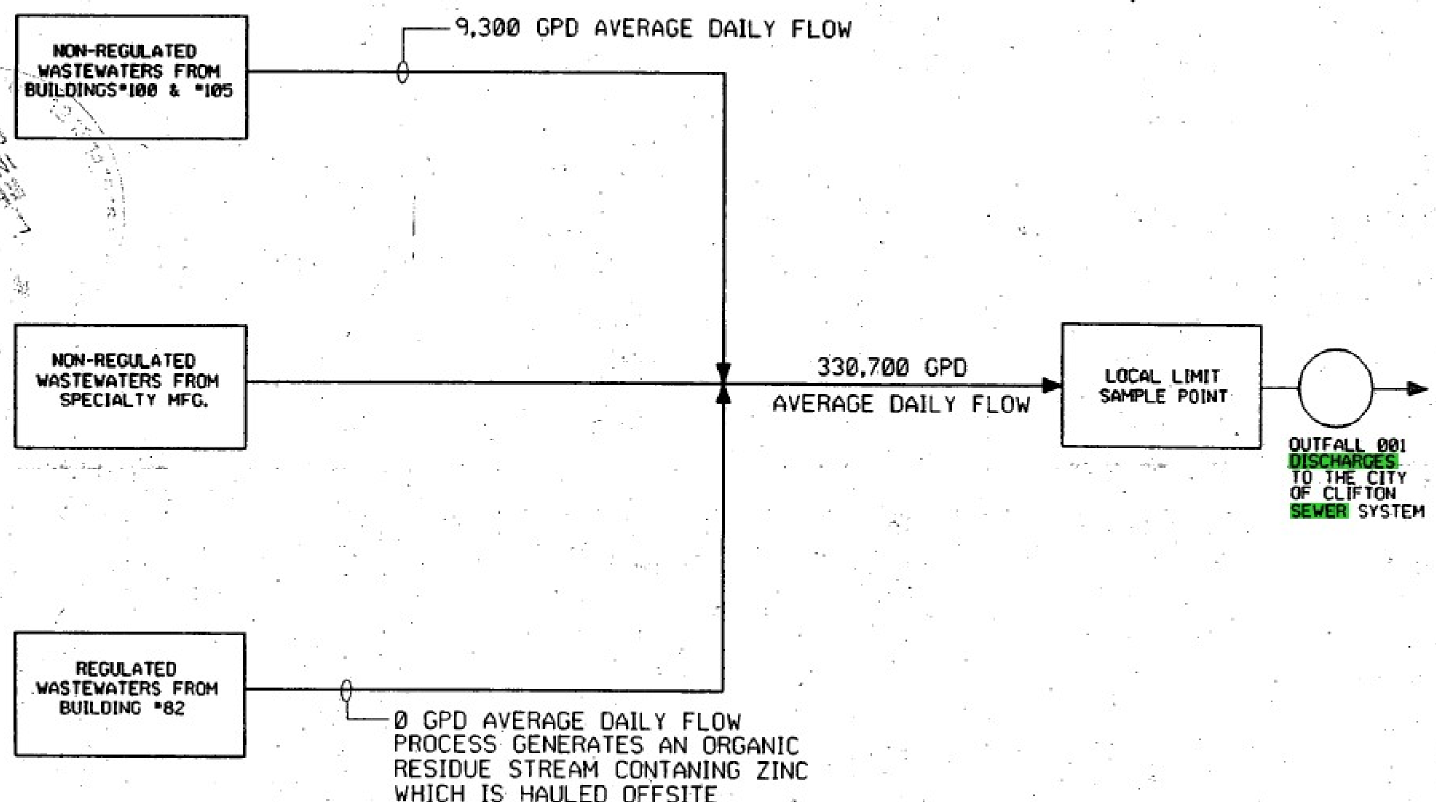


Appendix B-3. Wastewater outfall locations (PAP-00171809).



Appendix B-4. Wastewater flow diagrams for 1993, 1994, and 1995 (PAS-00036328, PAS-00036516-18, PAS-00036534).





OUTLET *1

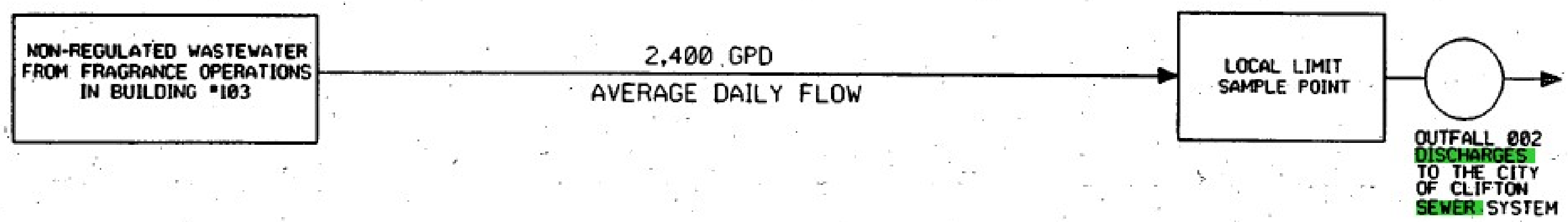
OUTLET 03401021 FOR USER CHARGE AND PRETREATMENT SAMPLE POINT/IS LOCATED BY SAMPLE SHED BUILDING *11 LOCATED IN SOUTHWEST CORNER OF PROPERTY (40 CFR 414)

NOTE: BMR REPORT SUBMITTED DECEMBER, 1994
RE: LOCAL LIMITS ON METALS

◯ = OUTFALL 001

GIVAUDAN-ROURE CORPORATION

UPDATED
FLOW DIAGRAM
OUTFALL 001
DECEMBER 1994



OUTLET *2

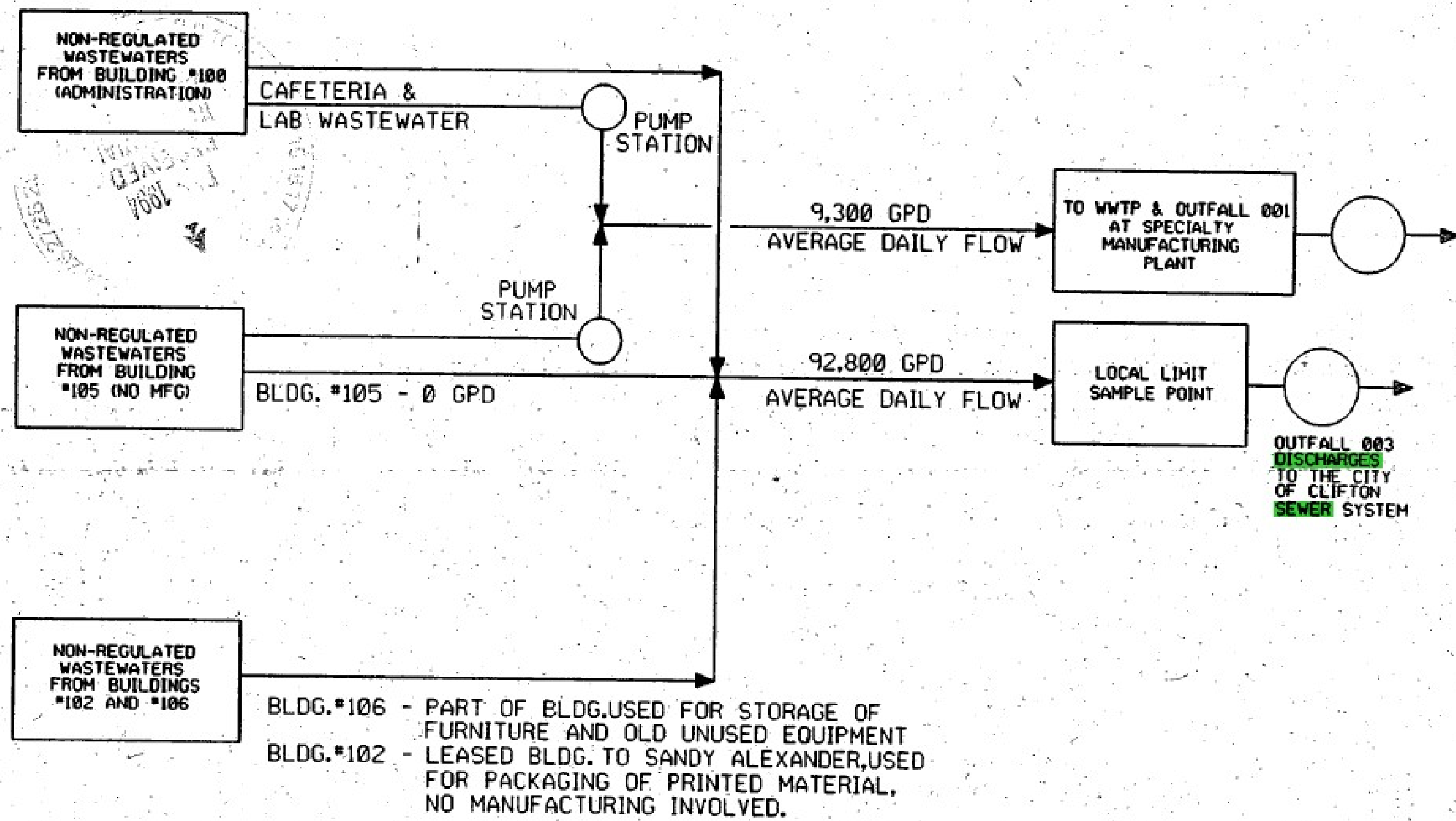
OUTLET 03401022 FOR USER CHARGE AND PRETREATMENT SAMPLE POINT/IS LOCATED IN THE LOCKER ROOM IN BUILDING *103

* NOTE: BMR REPORT SUBMITTED DECEMBER, 1994
RE: LOCAL LIMITS ON METALS

◯ = OUTFALL 002

GIVAUDAN-ROURE CORPORATI

UPDATED
FLOW DIAGRAM
OUTFALL 002
DECEMBER 1994



OUTLET #3

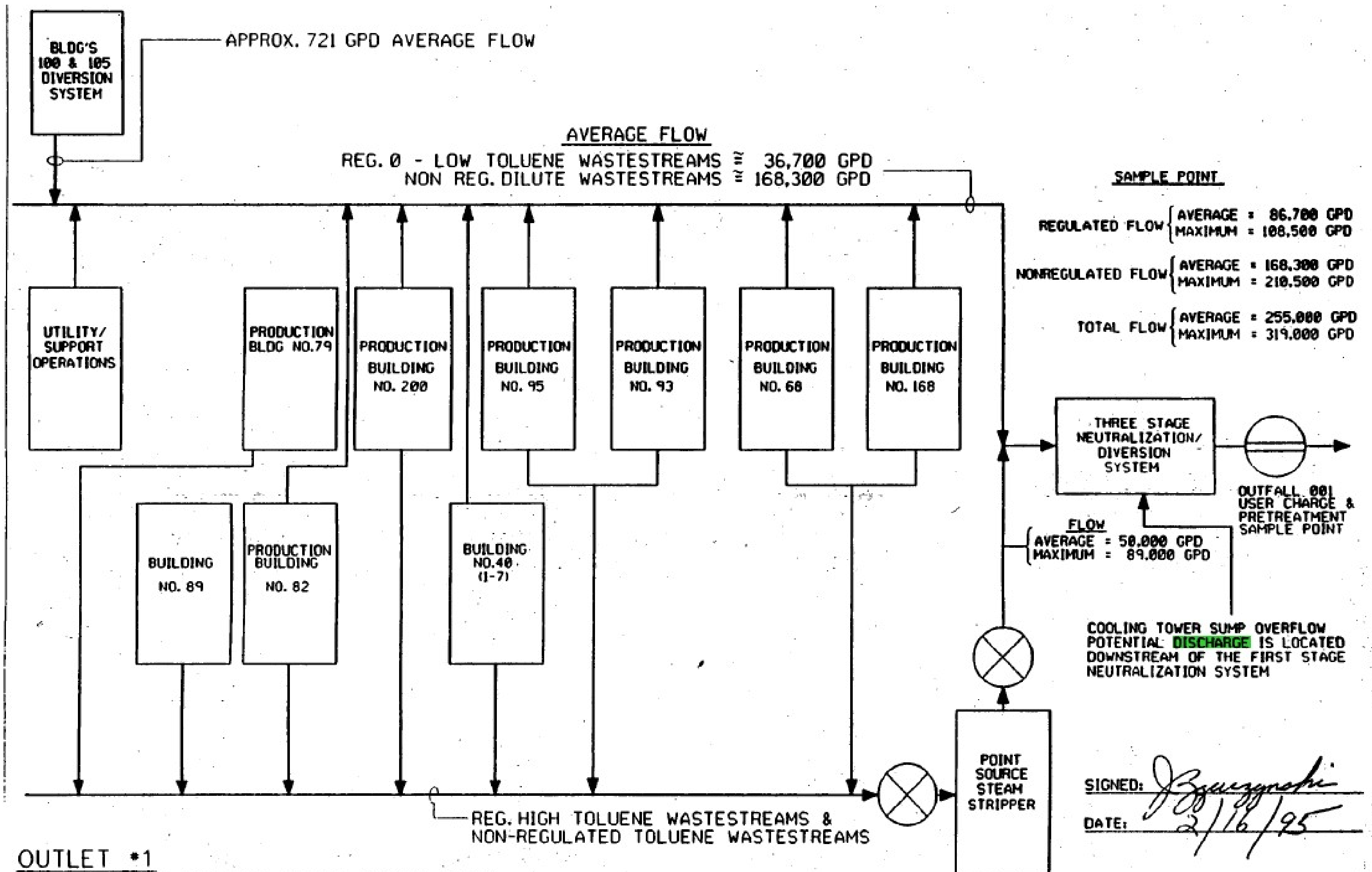
OUTLET 03401023 FOR USER CHARGE AND PRETREATMENT SAMPLE POINT/IS LOCATED IN THE DRIVEWAY OF BUILDING #105 ON PEEKAY DRIVE

NOTE: BMR REPORT SUBMITTED DECEMBER,1994
RE: LOCAL LIMITS ON METALS

◯ = OUTFALL 003

GIVAUDAN-ROURE CORPORATIO

UPDATED
FLOW DIAGRAM
OUTFALL 003
DECEMBER 1994



OUTLET #1

OUTLET 03401021 FOR USER CHARGE/PRETREATMENT IS LOCATED BY SAMPLE SHED BUILDING #11 LOCATED IN SOUTHWEST CORNER OF PROPERTY (40 CFR 414)

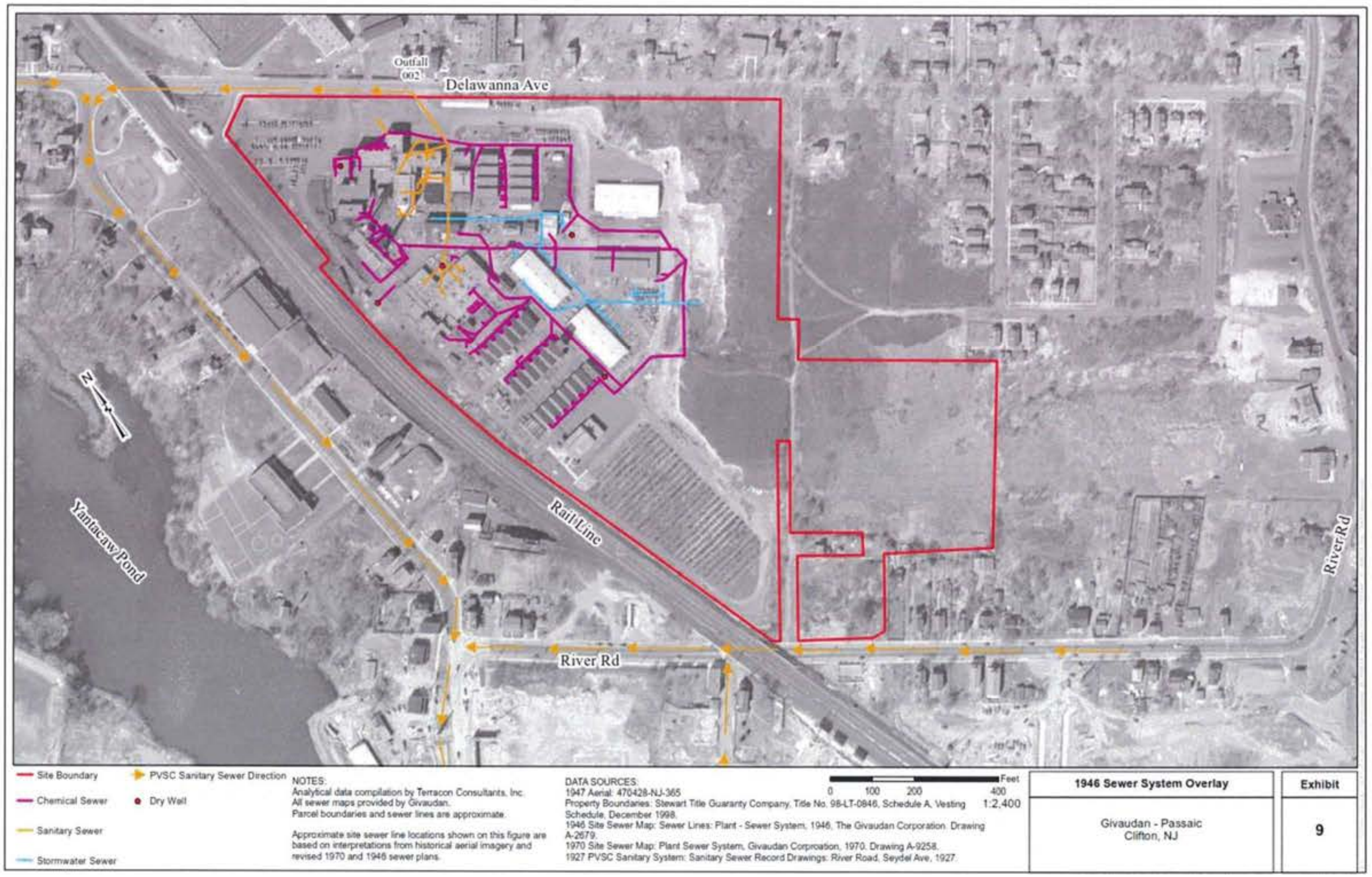
= COMPLIANCE MONITORING STATION

= MONITORING STATION

GIVAUDAN-ROURE CORPORATION

UPDATED WASTE WATER PFD OUTFALL 001 JANUARY 1995

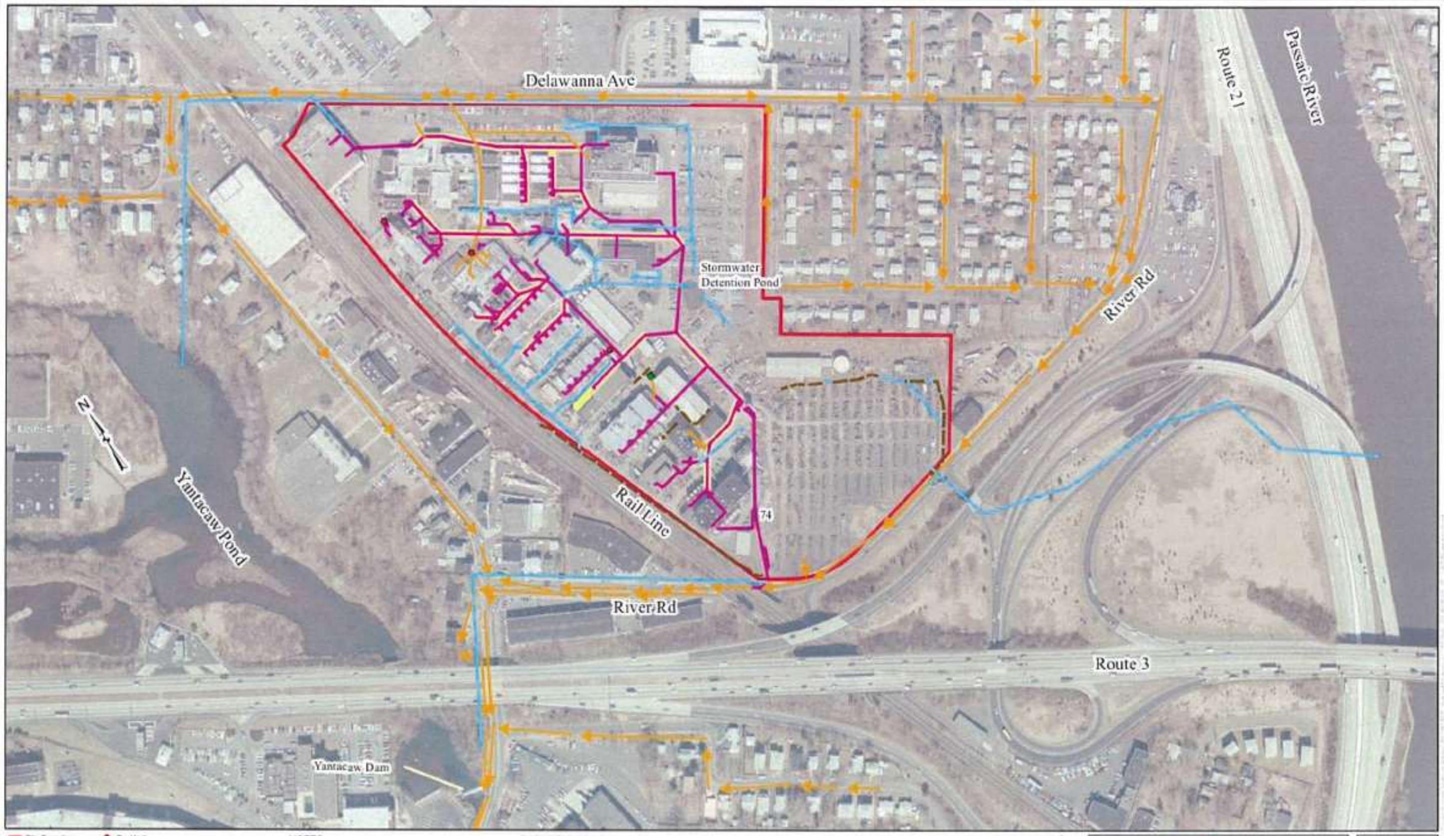
Appendix B-5. Facility sewer system in 1946 and 1979 (PAS-00048106, PAS-00048128).



1946 Sewer System Overlay

- Three primary systems appear active at the site, including:
  - Stormwater (blue) - discharging to the Stormwater Detention Pond
  - Sanitary (gold) – discharging to the City of Clifton Sewer at Outfall 002 on Delawanna Avenue
  - Chemical (purple) – discharging to dry wells throughout the site and to the Spent Acid Pit and the future Wastewater Detention Pond.
- Future aerial photos (see Exhibit 13) indicate the presence of the wastewater treatment building (Building 74). This building provided pre-treatment of process water (chemical system) prior to discharge to the City of Clifton Sewer at Outfall 001 on River Road.
- A series of drawings from 1927, titled "Sanitary Sewer Record Drawing" from the City of Clifton Bureau of Engineering, indicates city sanitary sewer lines were in place near the facility in 1927. As such, it is likely the facility's sanitary sewer system discharged to the City of Clifton system at Outfall 002 prior to 1946.
- A letter dated November 30, 1953 from Givaudan to the County Council, references an August 20, 1946 letter from City of Clifton to Givaudan that indicates the City and Givaudan were in discussions regarding the City's sewer system in 1946; suggesting Givaudan was connected in some capacity to the City sewer at that time.

:



Site Boundary
Chemical Sewer
Sanitary Sewer
Stormwater Sewer
Swale
Dry Well
Septic Tank
Poor Condition Sewers (Possible Exfiltration)
PVSC Sanitary Sewer Direction

NOTES:
Analytical data compilation by Terracon Consultants, Inc.
All sewer maps provided by Givaudan.
Parcel boundaries and sewer lines are

DATA SOURCES:
1979 Aerial Image: 790322-8-5964.
Property Boundaries: Stewart Title Guaranty Company, Title No. 98-LT-0846, Schedule A, Vesting Schedule, December 1998.
1970 Site Sewer Map : Plant Sewer System, Givaudan Corproation, 1970. Drawing A-9258.
Sanitary Sewer: Master Map, Sanitary Sewer System. City of Passaic.
1982 Chemical Sewer Investigation: Chemical Sewer Investigation Chemical Plant. CFM Incorporated. 1983. Drawing A-9475.
Stormwater Outfalls: Givaudan-Roure River Road - Water Problem Report. Corporate Environmental

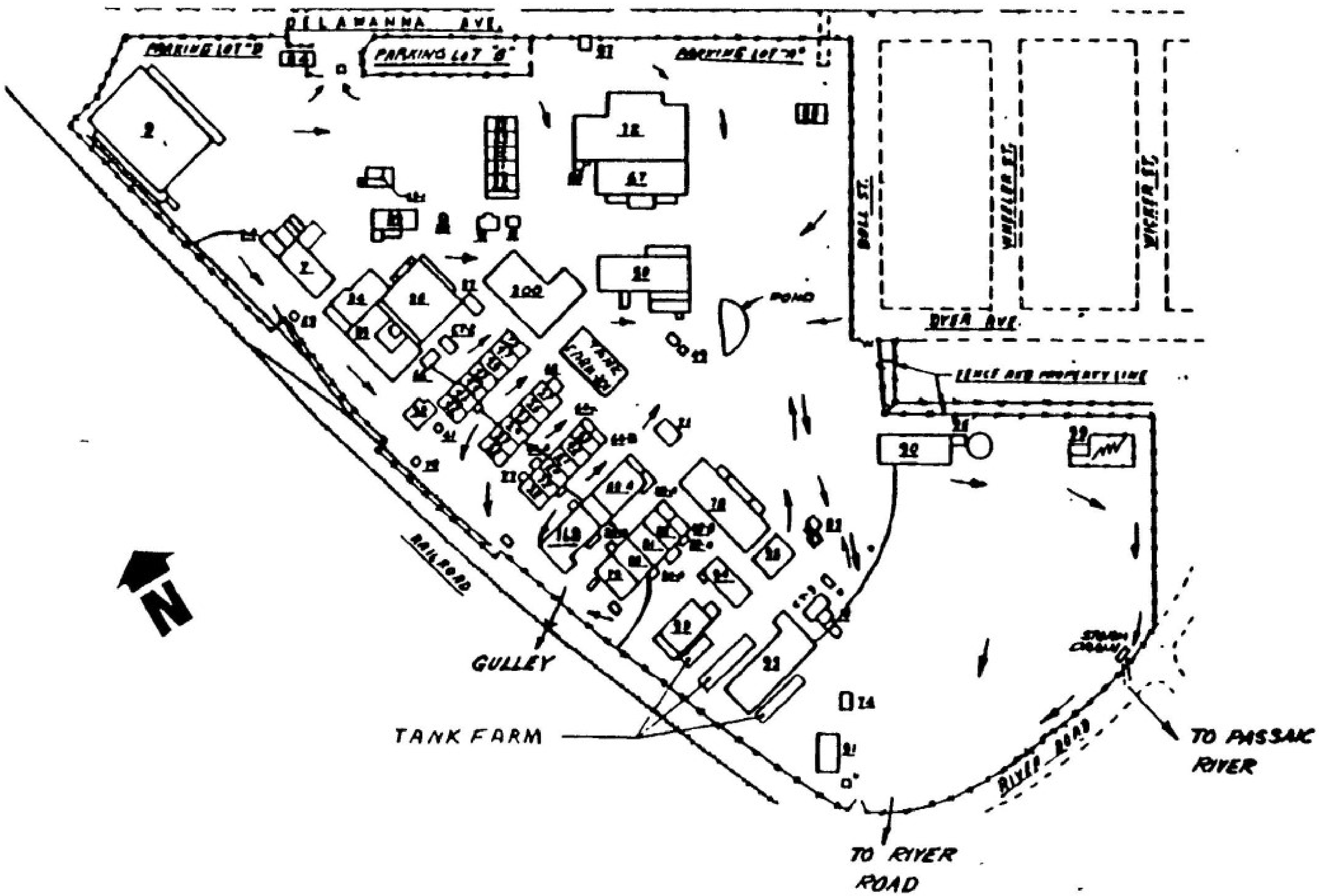
0 100 200 400 Feet
1:3,000

1979 Sewer System Overlay	Exhibit
Givaudan - Passaic Clifton, NJ	31

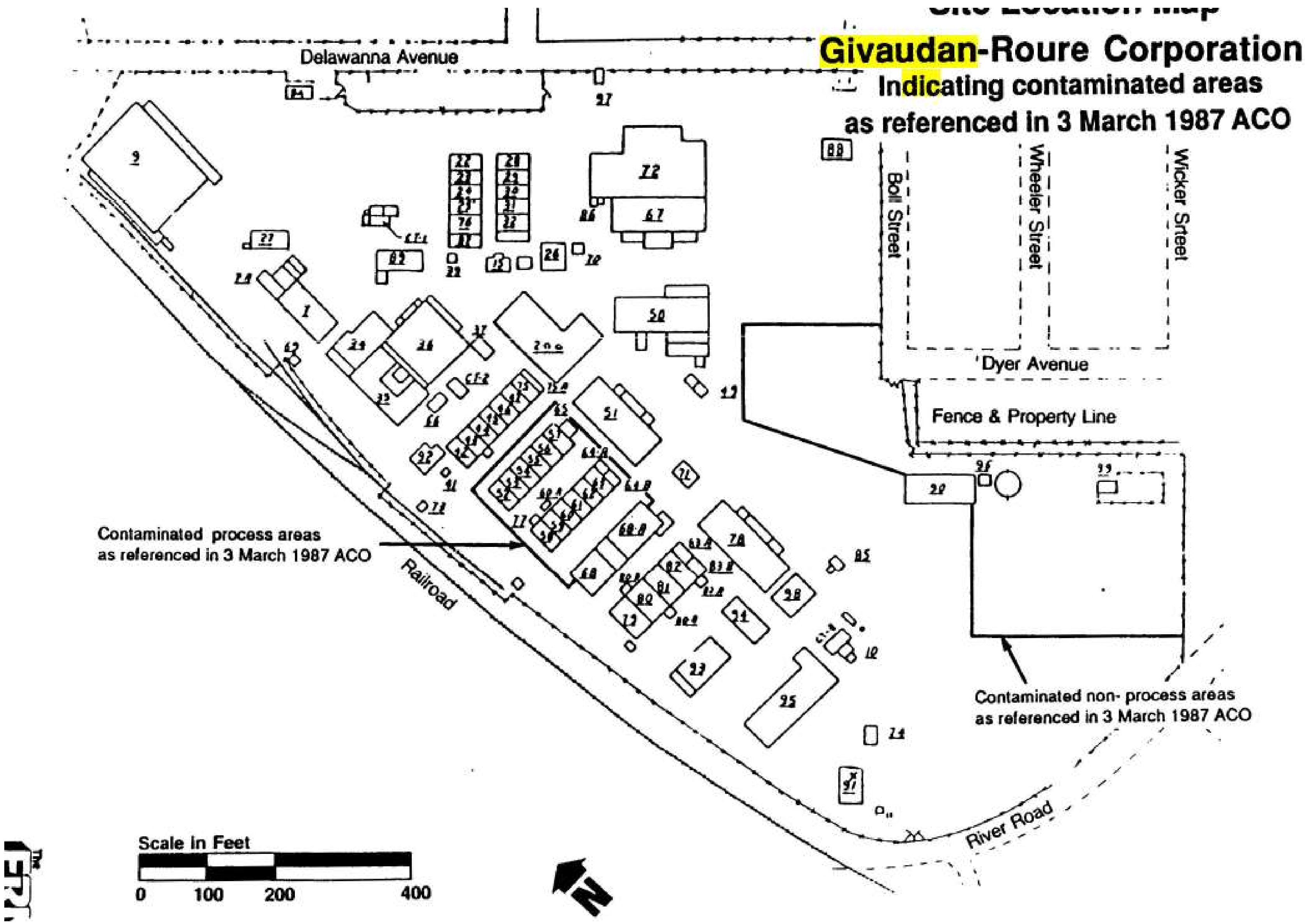
1979 Sewer System Overlay

- Three primary systems appear active at the site, including:
  - Stormwater (blue) - discharging to the Stormwater Detention Pond.
  - Sanitary (gold) – discharging to the City of Clifton Sewer at Outfall 002 on Delawanna Avenue and on-site septic tanks.
  - Chemical (Purple) – discharging to the City of Clifton Sewer at Outfall 001 on River Road.
- Chemical sewer lines with system with yellow highlights represent areas of poor condition lines (e.g., exfiltration areas) identified during a 1980s investigation.
- Brown dashed lines indicate areas of open storm water ditches.
- Chemical sewer system passes through Building 74 prior to leaving the site at River Road. Building 74 was first observed in the 1951 aerial photo.

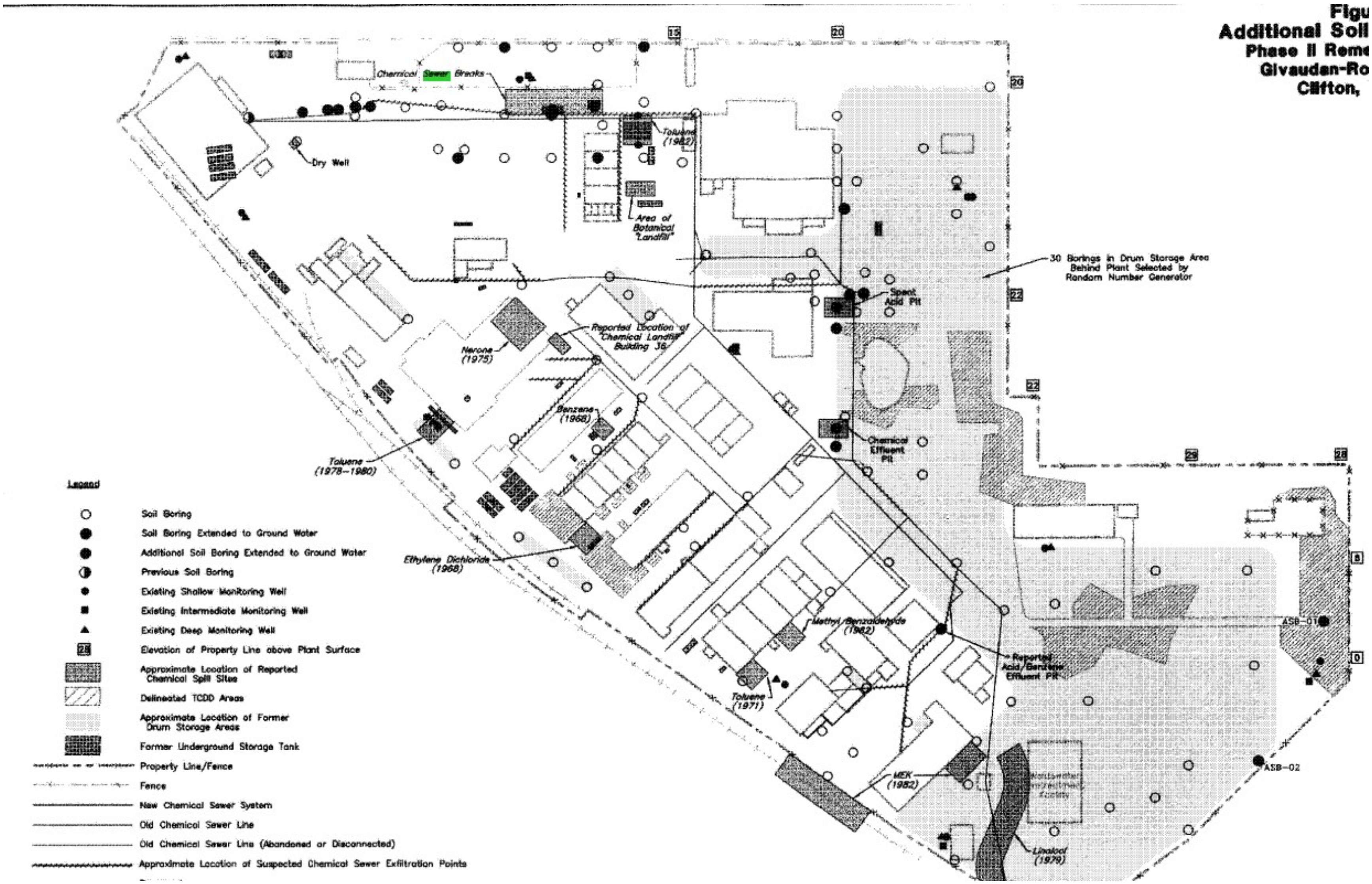
Appendix B-6. Stormwater Drainage Patterns (PAP-00179824).



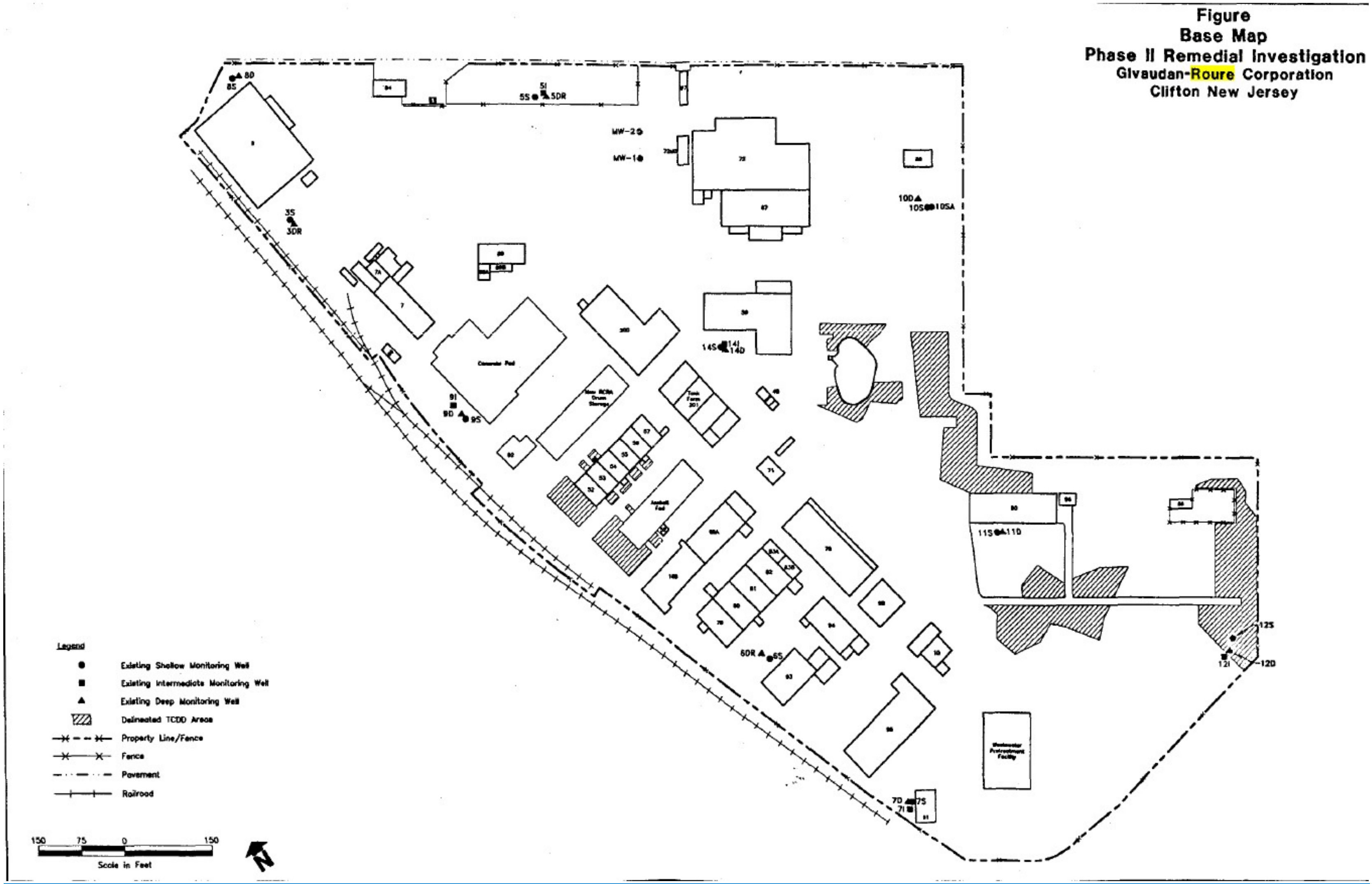
Appendix B-7. Locations of Contaminated Process Area and Contaminated Non-Process Area (PAP-00179697).



Appendix B-8. Location of drum storage area (PAP-00182357).



Appendix B-9. TCDD-impacted areas (PAS-00083406).



Diamond Alkali OU2 Allocation
ADR Confidential
Facility Data Report

GOODRICH CORPORATION

Facility Name, Address and Size: Goodrich Corp./Kalama Chemical, 290 River Drive, Garfield, New Jersey, 07026 (PAS-00123393); approximately 7 acres (PAS-00123393; PAS-00123398). 85 employees, 365 days per year, and 3 shifts per day in 1990 (PAP-00016715) and 1993 (PAP-00206151).

1. **Business Type:** Manufacturing of chemicals used in pharmaceuticals, cosmetics, food packaging, and preservatives, synthetic flavorings, printing inks, dyestuffs, and other products (PAS-00008962).

2. **Time Period of Ownership/Operations**

   Operator: December 1982 to May 1994
   Owner: December 1982 to Present (PAS-00123395-6, 8)

   1982: The Site was sold by Tenneco to Kalama Chemical, Incorporated (Kalama) in an Asset Sales Agreement. Assets identified in the sale included the machinery, equipment, furniture, fixtures, raw materials, work in progress, finished goods, operating supplies, etc. (PAP-00039792-95).

   1986: Partial ownership of Kalama was acquired by BC Sugar Refining Company, a Canadian sugar refining company (PAS-00008962; PAS-00123395).

   1990: BC Sugar acquired complete ownership of Kalama (PAS-00123396). Kalama filed lawsuit against Tenneco Polymers, Inc. (PAP-00046294).

   1991: During Kalama's tenure, operations were reduced in scale, and by 1991, operations were conducted in only one-third of the plant (PAP-00206156).

   1994: BC Sugar sold Kalama Chemical to Freedom Chemical Company (Freedom Chemical) (PAS-00123396). The lawsuit with Tenneco Polymers, Inc. (TPI) was settled, and TPI assumed primary responsibility for compliance with the New Jersey Department of Environmental Protection (NJDEP) Industrial Site Recovery Act (ISRA) regulations in accordance with the revised Administrative Consent Order (PAP-00046294). Operations at Kalama Chemical ceased in May and the manufacturing equipment and chemicals were removed from the facility by August (PAS-00008963; PAS-00123396).

   1998: Freedom Chemical was acquired by and merged into B.F. Goodrich Company. Media sources also note that Kalama, as a subsidiary of Freedom Chemical, was transferred to B.F. Goodrich (PAS-00123396).

3. **Operational History/COC Use and Presence at the Facility**

   According to the *Remedial Investigation Report and Remedial Action Work Plan for the Northern Phenol Area and Dowtherm DNAPL Areas,* dated February 13, 2004, the site was used for chemical manufacturing since 1891. Kalama took ownership in 1982 and

manufactured chemicals used in pharmaceuticals, cosmetics, food packaging and preservatives, synthetic flavorings, printing inks, dyestuffs, and other products (PAS-00008962).

A letter from Kalama to the Passaic Valley Sewerage Commissioners (PVSC), dated June 15, 1988, listed the following chemicals as used or produced at the site:

Salicylic Acid
Methyl Salicylate
Parasepts® (a registered trademark of Kalama for its brand of methyl, ethyl, propyl, and butyl esters of p-hydroxy benzoic acid, also known as Parabens)
Methylene Disalicylic Acid (M.D.A.®)

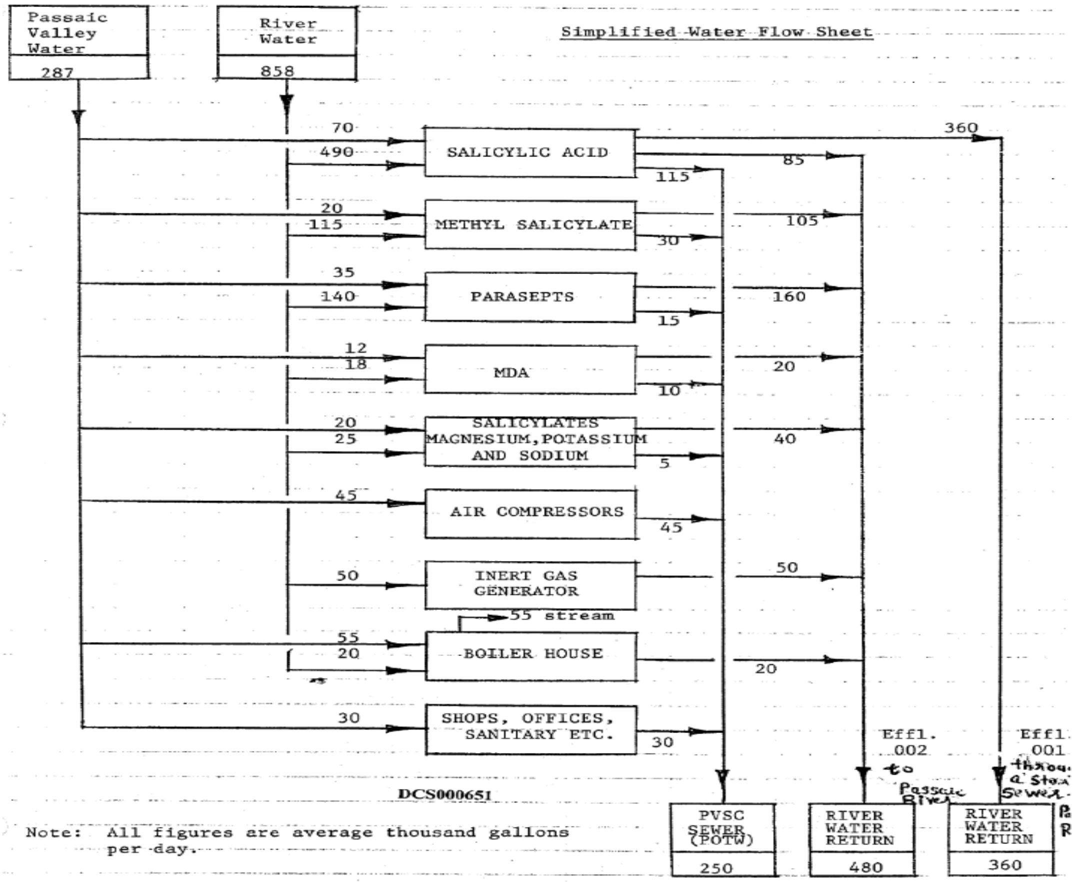
Raw materials used for production of these products:

Water	Formaldehyde
Phenol	Toluene
Methanol	Sodium hydroxide
Sulfuric acid	Carbon dioxide
Propanol	Ethanol
Butanol	Pottassium Hydroxide

(PAP-00206172-73; PAP-00433761)

According to the *ECRA Investigation Report and Proposed Remedial Action Workplan, Volume I of IV*, dated December 1993 (ECRA Investigation Report), Kalama stopped synthesizing benzoic acid and benzaldehyde in early 1984, a little over a year after it acquired the property (PAP-00041526).

A schematic of the water flow at the facility for each process was provided in a 1989 fact sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey (Permit No. NJ0000124). Two outfalls to the Passaic River and one outlet to the PVSC sewer were identified (PAP-00206141). A report titled *Environmental Assessments, Draft Report for B.C. Sugar*, dated September 3, 1991 (1991 EA) stated that all process waste was discharged to the PVSC under permit number 09404292 (PAP-00433578).



(PAP-00206141)

As discussed in the ECRA Investigation Report, the site consists of two properties; the manufacturing facility (6.4 acres) and the former employee parking area (0.5 acres) located across River Drive and along the Passaic River. The site is surrounded by mixed residential, commercial and industrial properties on the north, south and east. The Passaic River borders the site on the west, approximately 100 feet from the former manufacturing operations (PAP-00041522-23).

The 1991 EA identified areas of potential environmental concern resulting from on-site operations and hazardous materials handling practices (PAP-00433546). It also discussed buildings where the following operations were identified:

- Building 1: boiler room, housing oil-fired steam boilers, compressors and other ancillary power-generation equipment, six transformers located between Building 1 and Building 33 were each labeled with a sticker stating that the PCB content of the transformer was <50 parts per million (ppm).
- Building 7: formerly a copper shop where sheet metal was fabricated; used for maintenance and equipment storage at that time.

- Building 11: reportedly used for naphthalene distillation but appeared to be idle at the time. The *Revised Remedial Action Work Plan*, dated March 31, 1995 (1995 RAWP) stated this building was inactive since 1965 (PAP-00041642).

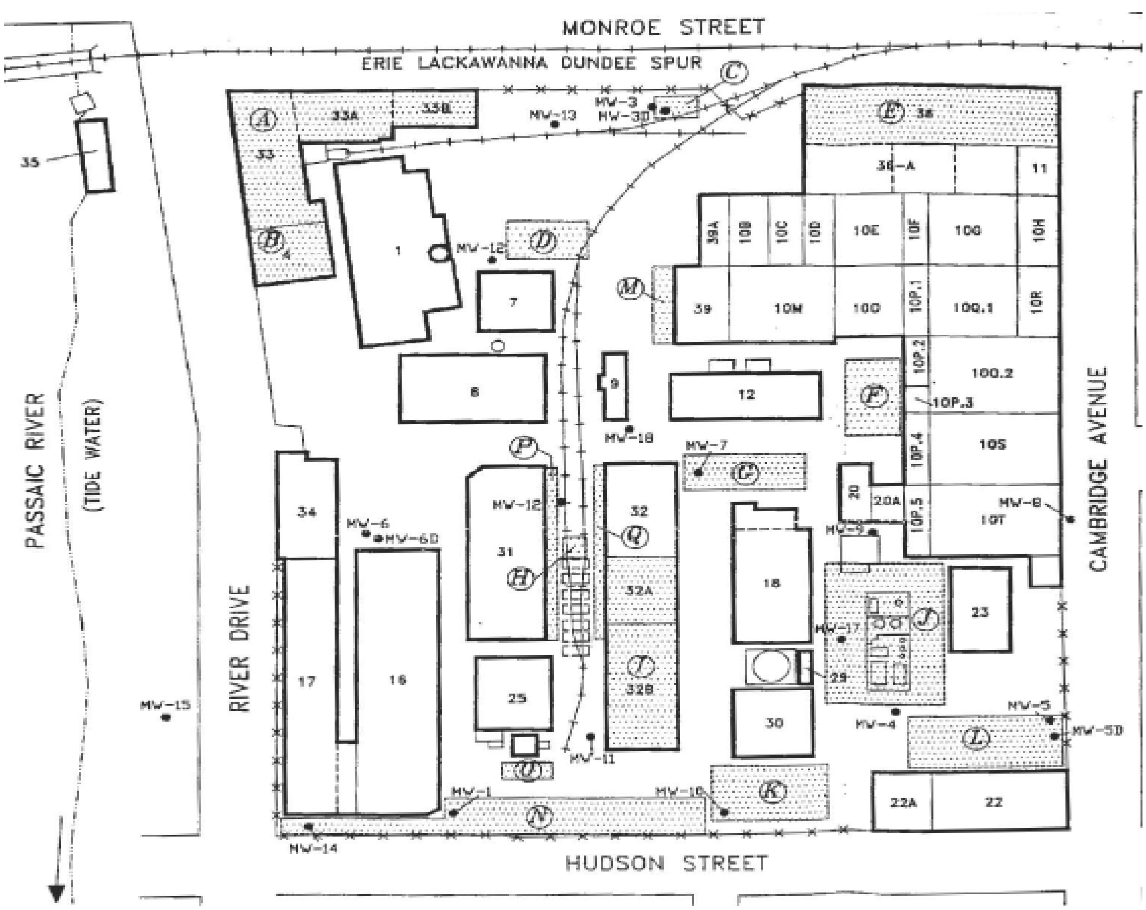
- Building 12: a transformer labelled with a sticker stating that the unit contained <50 ppm PCB was outside Building 12 on a concrete pad.

- Building 16: previously rented by Glare Industries, which was described as having manufactured urinal blocks (Note: As noted below, other documentation establishes that Glare Industries only packaged urinal blocks (PAP-00433528-9)).

- Building 17: leased to Chemo Dynamics Inc. and contained laboratories.

- Building 35: pump house located on the banks of the Passaic River; a transformer was observed and appeared to have a label indicating that the PCB content of the unit was <50 ppm.

- Building 36: three transformers located on the second floor; appeared to be labeled as containing <50 ppm of PCB. (PAP-00433546-57)



(PAP-00433612)

According to the 1993 ECRA Investigation Report, approximately 38 buildings once existed on the site, half of which were used for manufacturing operations by Kalama (PAP-00041525). The 1995 RAWP stated most manufacturing equipment and all production-related chemicals were removed from the site between May and August 1994. Ten buildings (2, 3, 8, 10-A, 10-N, 37, 38, 39, and 39A) had been dismantled over the years (PAP-00041636).

After Kalama took ownership of the site in 1982, portions of the site were operated by other companies.

- A November 25, 1985, registration form for the City of Garfield Bureau of Fire Protection identified "Bldg. 16 (Glair) AMK Manufacturing" as operating an industrial packaging plant for urinal blocks at the Garfield facility owned by Kalama (PAP-00433528), while the 1991 EA stated a "Glare Industries" had previously rented Building 16 for the manufacturing of urinal blocks (PAP-00433552).

- Hart Chemical Co. was identified at the facility site in a December 15, 1988, Garfield Fire Department Application for Certificate of Inspection and an October 4, 1989, New Jersey Bureau of Fire Safety verification/update request. The 1989 document noted Hart Chemical was not open for business (PAP-00433766).

- A February 11, 1991, Addendum to the Lease Agreement dated December 22, 1988, between Landlord Kalama Chemical, Inc. and Tenant, Chemo Dynamics, Inc. stated Chemo Dynamics, Inc. leased the area immediately behind their laboratories in Building 17 (1,600 square feet). Chemo Dynamics performed custom synthesis in small batches (1-25 kilograms) for the pharmaceutical and food industries (PAP-00433552). An additional Addendum dated August 10, 1992, stated Chemo Dynamics, Inc. also leased 729 square feet east of their pilot plant in Building 17 (PAP-00433536, 38).

4. Identified COCs

- PCBs (, used detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (detected)
- Mercury (detected)

PCBs

The 1991 EA identified several transformers at the site and each was noted to be labeled as containing less than 50 ppb PCBs (PAP-00433546-57).

Two areas containing transformers were identified as areas of environmental concern (AECs) in the 1995 RAWP (PAP-00041652). According to the *Comprehensive Remedial Action Work Plan Addendum*, dated March 14, 2008 (Comprehensive RAWP), PCBs were not detected in site soil at AEC-23 (Transformers at Building 1), but were detected in soil samples collected from AEC-24 (Transformer at Building 12) at a maximum of 2.2 milligrams/kilogram (mg/kg) for Aroclor-1260. This sample (B-44-01

DUPE) was collected from a depth of 0.3-0.8 feet, and two of eight delineation samples collected later from a depth of 0.3-0.8 feet and 1.5-2.0 feet to confirm the findings detected PCBs up to 0.22 mg/kg (PAP-00046359-60).

The *Remedial Investigation and Remedial Actions Report, Building 17 & Former Sewer Lines*, dated February 26, 2003, (2003 RI/RAR) identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Fill was discovered within the foundation walls of the building and was analyzed for PCBs as part of the waste disposal characterization. PCBs were detected at 15.8 mg/kg in one soil sample, but additional delineation samples did not detect PCBs. An area of 19 feet by 27 feet was excavated to a depth of 4 feet around the sample location (PAP-00044391-92). Building 17 was located in the southwestern corner of the site as shown on the figure above.

PAHs

The Comprehensive RAWP identified AECs 1, 3, 6, 10, and 11 as formerly containing fuel oil underground storage tanks (USTs). The USTs were excavated between 1987 and 1990. Only the soil at AEC-11 showed PAH-impacted soil. Sample S-2, collected from a depth of 2 to 4 feet, had a maximum concentration of benzo(b)fluoranthene of 5.69 ppm (see Section 7 for all PAH concentrations at S-2) (PAP-00046310, 16, 18, 20-21, 31-33).

As discussed in the 1993 ECRA Investigation Report, PAHs were detected in 50 of 69 soil samples analyzed for PAHs. The total PAH concentrations ranged from an estimated 0.018 ppm in Sample B-43-A to approximately 101 ppm in Sample B-52-A, collected just south of former fuel oil UST A-4 (PAP-00041235).

According to the data reported in the 1995 RAWP, PAHs were detected at most AECs when soil samples were analyzed for these parameters (PAP-00041858-86). The highest concentrations were detected at AEC-11 (Former No. 2 Fuel Oil USTs), AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39), and AEC-21 (Drum Storage Area Buildings 16 and 17). The maximum concentrations of PAHs were detected from soil sample AEC-15-1C at AEC-15 (see concentrations in the discussion of Historic Fill and in Section 7, Response Actions) (PAP-00042265).

The *Revised Remedial Action Work Plan Addendum*, dated February 29, 1996 (RAWP Addendum) stated that fill material, including sand, gravel, brick and rock fragments, cinders, and ash, had been noted at the site and extending off site. The RAWP Addendum investigated soil boring B-52-A, detecting concentrations of benzo(a)pyrene up to 42 ppm, and attributed the elevated PAH concentrations to the presence of fill (PAP-00042178-79). The Comprehensive RAWP attributed PAHs at several AECs (e.g., AEC-14 and AEC-15) to the fill material at the site since PAHs would not have been used at the facility (PAP-00046341, 44).

The 2003 RI/RAR found elevated PAHs detected in mud from a concrete basin (AEC-32A) north of Building 17 (i.e., 6.1 ppm of benzo(a)anthracene; 4.45 ppm of benzo(b)fluoranthene; 3.04 ppm of benzo(k)fluoranthene; and 4.42 ppm of benzo(a)pyrene). It was stated that this basin drained sinks in the laboratory, but did not connect to a sewer and instead had vents to allow for evaporation (PAP-00044389, 91).

Copper

The 1991 EA identified Building 7 as a former copper shop where sheet metal was fabricated, but it is unclear when this building was used for this purpose (PAP-00433547). A 1989 fact sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey (Permit No. NJ0000124) noted that the limitation on copper was removed because the facility informed NJDEP that they did not use copper (PAP-00206137, 44).

A NJDEP Hazardous Waste Generator Annual Report lists hazardous wastes shipped offsite in the year 1989, including 18 pounds of Waste Poison B solids identified as P029 (copper cyanide) among others (PAP-00433733).

According to the 1990 PVSC Application for a Sewer Connection Permit, Effluent 003 is the Kalama designation for outlet 09404292-21040-0091, which contained industrial waste discharged to the PVSC. This permit application also noted copper was detected at 9 mg/L in the waste water effluent (PAP-00016718, 21). A previous PVSC Application for a Sewer Connection Permit from 1986 stated copper was detected at 2.3 mg/L (PAP-00206124).

An undated NJDEP application for permit to discharge to a domestic treatment works stated the process waste (effluent 003) had copper at 1.0 mg/L (PAP-00433687). Copper was detected in surface soil (Sample B-47-Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at a maximum concentration of 550 ppm (PAP-00041872). Copper was also detected in filter cake material at 223 ppm located between crushed white rock found in a 40-foot-long concrete trough at Building 17 (AEC-32C, Concrete Trough). The soil sample collected beneath the trough detected copper at 52.4 ppm. The concrete trough was excavated in 2002, including an area of 12.5 feet by 60 feet and 5 feet deep and consisting of 210 tons of soil (PAP-00044395-97, 455).

Lead

Although lead was not reported to be included in the operations at the site, a sample of Methylsalicylate Still Bottoms collected April 10, 1991, was analyzed by Toxicity Characteristic Leaching Procedure and resulted in lead concentration of 0.132 mg/L (PAP-00433740).

A NJDEP Hazardous Waste Generator Annual Report lists hazardous wastes shipped offsite in the year 1989, including 107 pounds of hazardous waste solids identified as D008 (lead) among others (PAP-00433733).

Pretreatment monitoring reports for discharges to the PVSC included results for lead in composite samples collected during three months in 1991 as reported below. The monitoring reports stated that metals were not used at the facility (PAP-00433622; PAP-00433632; PAP-00433642).

Effluent Monitoring of Lead		
Month in 1991	**Result (µg/L)**	**Average Flow (GPD)**
July	150	251,000
October	140	271,000
November	120	129,000

(PAP-00433625; PAP-00433635; PAP-00433645)

Results for a sample of “PV 003 Effluent – Pretreatment (composite)” collected March 2, 1993, had lead (0.0020 mg/L) (PAP-00433666-67). According to the 1990 PVSC Application for a Sewer Connection Permit, Effluent 003 is the Kalama designation for outlet 09404292-21040-0091, which contained industrial waste. This permit application also noted that lead was not expected to be present in the waste water (PAP-00016718, 21).

An undated NJDEP application for permit to discharge to a domestic treatment works stated the process waste (effluent 003) had lead at 0.09 mg/L (PAP-00433687).

Analytical results for outfalls to the Passaic River were reported in an undated EPA form 3510 2C (Rev. 2-85). Lead (15 µg/L) was detected in Outfall 002 (PAP-00433658). The long-term average value for lead in the intake water was listed as 16 µg/L (PAP-00433658).

According to the 2003 RI/RAR, lead was detected in filter cake material at 594 ppm found at AEC-32C (Concrete Trough) in Building 17. Soil beneath the trough contained lead at 43.6 ppm (PAP-00044395-97, 455). After the trough was excavated in 2002, the loading dock between Building 16 and Building 17 was investigated. Fill material consisting of crushed rock, brick, wood chips, and glass was found beneath the loading dock. The fill was 1 foot thick, while the native soil beneath consisted of a fine sandy silt. A sample from the fill material contained 42,000 ppm lead, while the native soil beneath this location detected lead at 35.9 ppm. Approximately 166 tons of soil were excavated from this area in 2002 (PAP-00044397-99, 457).

The 2008 Comprehensive RAWP stated that lead was detected up to 820 ppm in AEC-15, but the lead was attributed to historic fill because it was never used in any of the manufacturing processes at the site (PAP-00046343-44). Lead was also detected up to 2,830 ppm in crushed concrete in the basement of former Building 33-B. The concrete was generated during demolition activities. The text stated that the lead contamination in the crushed concrete would be addressed by the site wide institutional and engineering controls that will be implemented for the historic fill material (PAP-00046395-96).

Mercury

A NJDEP Hazardous Waste Generator Annual Report lists hazardous wastes shipped offsite in the year 1989, including 107 pounds of hazardous waste solids identified as D009 (mercury) among others (PAP-00433733).

An undated NJDEP application for permit to discharge to a domestic treatment works stated the process waste (effluent 003) had mercury at <0.0005 milligrams/liter (mg/L) (PAP-00433687).

Analytical results for outfalls to the Passaic River were reported in an undated EPA form 3510 2C (Rev. 2-85). Mercury was detected at 0.2 µg/L in Outfall 002 (PAP-00433658).

Mercury was detected in subsurface soil (depth of 4 to 4.5 feet, Sample B-53 Fill) at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39) at a maximum concentration of 18.6 ppm (PAP-00041873). Mercury was also detected at a concentration of 15.5 ppm from the soil along the sewer line (depth of 2.5 to 3 feet, Sample SL-17-1) at AEC-33 (Building 17 Sewer Line). Approximately 110 tons of soil were excavated from the sewer line and disposed off-site (PAP-00046380-1).

According to the 2003 RI/RAR, mercury was also detected in filter cake material at 100 ppm located between crushed white rock found in a 40-foot-long concrete trough at Building 17 (AEC-32C, Concrete Trough). The soil sample collected beneath the trough detected mercury at 0.58 ppm. An area of 12.5 feet by 60 feet and 5 feet deep was excavated around the concrete trough in 2002, and included 216 tons of soil (PAP-00044395-97, 455).

Historic Fill

The Allocation Team has determined that the majority of the facility site is not located on regional historic fill as designated by the NJDEP.[1]

However, NJDEP-designated regional historic fill is present at the northwest corner of the site under Monroe Street. Site investigations found man-made materials (crushed stone, brick and sandstone fragments, cinders ash,) characteristic of historic fill in the subsurface throughout the facility and offsite at depths up to 10 feet below ground surface (bgs) (PAP-00041645, PAP-00042178). In addition, the 1996 RAWP Addendum attributed elevated concentrations of PAHs and lead at the former Salicylic Acid/Salicylate Production Buildings located at the northeast portion of the site to the presence of fill (PAP-00042177-80). The 2008 Comprehensive RAWP attributed elevated concentrations of PAHs at AECs 14, 15, 21, 26, 30, 31, and 34 to “historic fill” (PAP-00046341, 44, 58, 62, 67-8, 70, 82).

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[1] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 42 (NJDEP map identifying locations of recognized historic fill).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[2] Accordingly, NJDEP technical requirements for property containing historic fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[3] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of historic fill at varying levels, not atypically at or exceeding residential soil standards.[4]

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00041872-3; PAP-00042265).

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	42,000 mg/kg
Copper	550 mg/kg
Mercury	18.6 mg/kg
Benzo(a)anthracene	41.0 mg/kg
Benzo(a)pyrene	42.0 mg/kg
Benzo(b)fluoranthene	38.0 mg/kg
Benzo(k)fluoranthene	13.0 mg/kg
Dibenzo(a,h)anthracene	5.5 mg/kg
Indeno(1,2,3-cd)pyrene	33.0 mg/kg

5. COC Pathways

Sanitary/Combined Sewer

A letter from Kalama to the PVSC, dated December 21, 1982, stated that the Garfield, New Jersey, facility had been acquired by Kalama as of December 9, 1982, and waste water was discharged to the PVSC Treatment Works under Sewer Connection Permit No. 0940722, which had been issued to the previous owner Tenneco Chemicals, Inc. on January 23, 1981, and expired January 26, 1986. The letter also stated that the flow rate, analysis, and flow characteristics of wastewater effluent remained the same even though the ownership had changed (PAP-00208804). A list of the waste water flow rates from each department at the facility to the “PV Sewer” was dated May 1981, and identified the total flow to the sewer at that time as 85.48 million gallons per year (PAP-00433614, 20).

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[2] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[3] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[4] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of historic fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area historic fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The 1991 EA stated that all process waste was discharged to the PVSC under permit number 09404292 (PAP-00433578). This PVSC Sewer Connection Permit was effective May 27, 1986, and expired May 27, 1991. Effluent limitations were defined for two outlets, 09404291-21040-0091 (discharge point No. 3) and 09404292-21040-0091 (discharge points No. 1 and 2), including a daily maximum total for lead of 690 µg/L and a maximum monthly average of 320 µg/L to be reported semiannually (PAP-00016682, 86-89, 90-92).

An undated NJDEP Application for Permit to discharge to a domestic treatment works identified outlets 001 (Sanitary Building No. 17), 002 (Sanitary Building No. 34), and 003 (process wastes, boiler house, air compressors, shops, offices, sanitary, etc.) to the PVSC. Outlet 003 had a pH neutralization listed for its treatment. In addition, this outlet was stated to have copper at 1.0 mg/L, lead at 0.09 mg/L, and mercury at less than 0.0005 mg/L. PAHs were listed as not detected (PAP-00433684, 87-88).

As of March 14, 1986, daily flow at outlet 09404291 was reported as 315,000 gallons (PAP-00206123). The Baseline Monitoring Report submitted under the OCPSF (Organic Chemicals, Plastics and Synthetic Fibers) Category (40 CFR 414 and 416), dated June 15, 1988, listed the total waste water from the facility as an average flow rate of 335,000 GPD (for OCPSF-regulated wastewater, 270,000 GPD) and a maximum flow rate of 380,000 GPD (for OCPSF-regulated wastewater, 310,000 GPD). (PAP-00206174). Information on Compliance with OCPSF Category stated the annual volume of wastewater from the facility was 119,435,000 gallons, while the daily average was 327,000 gallons in 1989 (PAP-00433668, 73). In 1990, pretreatment standards for discharge to the PVSC treatment plant were a daily maximum of 690 ppb and a monthly average of 320 ppb for lead. Kalama's total waste water flow was listed as 275,000 gallons per day (GPD), while flow from Kalama's OCPSF operations was 265,000 GPD (PAP-00016701-2). In 1993, pretreatment standards for lead discharge were the same as in 1990. Kalama's total waste water flow to the PVSC treatment plant was listed as 327,000 GPD, while flow from Kalama's regulated waste water flow was 322,000 GPD (PAP-00433676-77).

According to a PVSC Application for a Sewer Connection Permit, dated May 5, 1986, 113,607,000 gallons of process waste water and approximately 1,440,000 gallons of sanitary service water went to the combined sewer from January 1985 through December 1985 (PAP-00206120-21, 29).

According to a PVSC Application for a Sewer Connection Permit, dated November 27, 1990, 80,699,000 gallons of process waste water and approximately 1,440,000 gallons of sanitary service water went to the combined sewer from October 1989 through September 1990 (PAP-00016715-17).

The flow rates through outlet No. 09404290-21040-0091 during three months in 1991 were reported in Pretreatment Monitoring Reports for the PVSC.

Total Flow		
Month in 1991	**Maximum (GPD)**	**Average Flow (GPD)**
July	318,000	251,000
October	361,000	271,000
November	191,000	129,000

(PAP-00433621; PAP-00433631; PAP-00433641)

Results for a sample of "PV 003 Effluent – Pretreatment (composite)" collected March 2, 1993, had lead (0.0020 mg/L) but PAHs were not detected (PAP-00433666-67). According to the 1990 PVSC Application for a Sewer Connection Permit, Effluent 003 is the Kalama designation for outlet 09404292-21040-0091, which contained industrial waste. This permit application also noted that lead was not expected to be present in the waste water, but copper was detected at 9.0 mg/L (PAP-00016718, 20, 21).

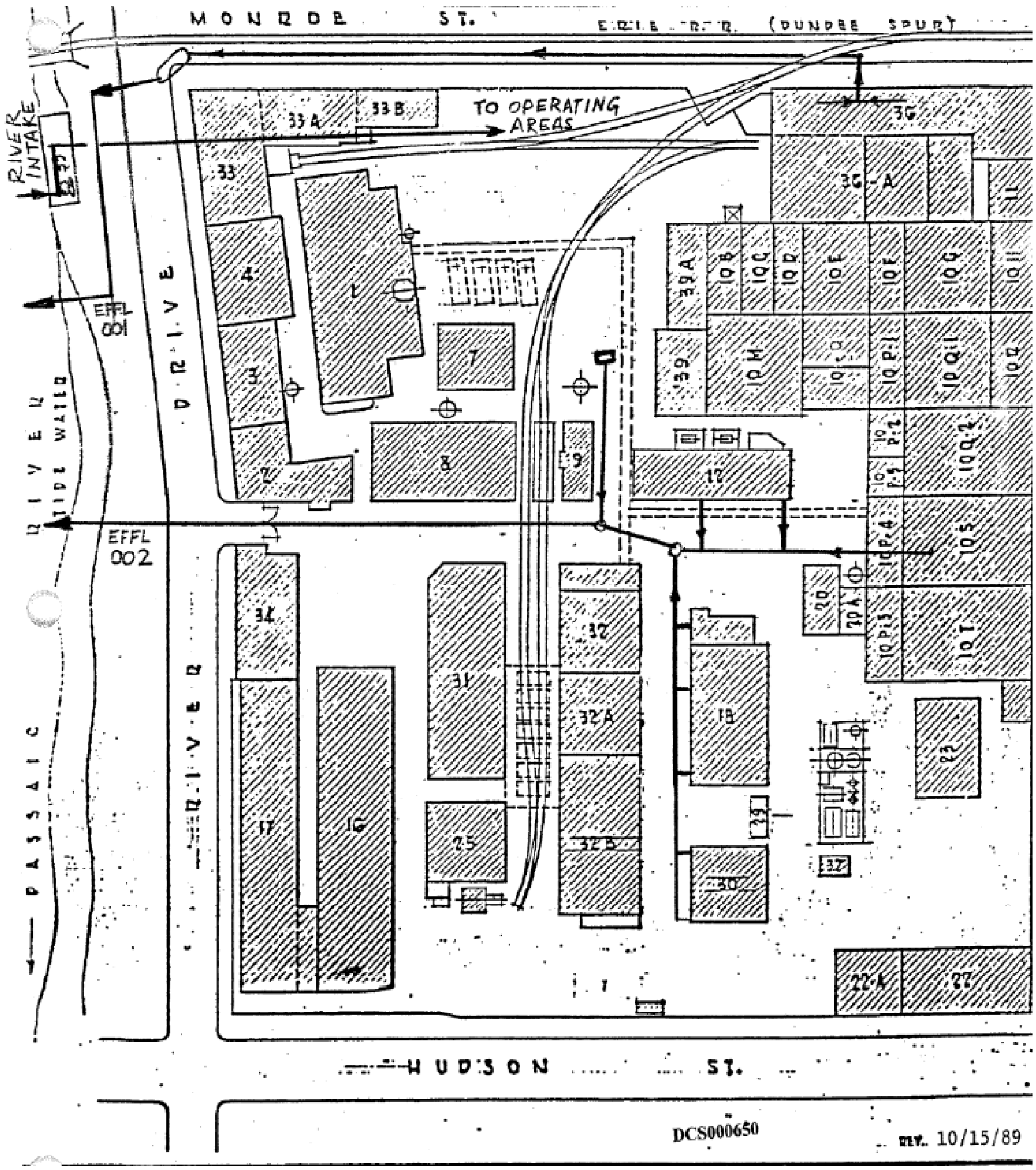
An Industrial User Charge/Pretreatment Inspection Report stated an annual inspection was performed March 25, 1993. Meter readings for average daily water use were reported as 700,000 GPD of river water and 150,000 GPD of waste water. The report also stated contaminated storm water was treated and then discharged to the sewer, while uncontaminated water was discharged to the river (PAP-00206151, 53, 55).

According to the 1993 ECRA Investigation Report, the process waste water lines connected to the PVSC trunk line beneath River Drive (PAP-00041523).

Direct Release

According to the 1991 EA, Kalama had two separate outfalls that discharged to the Passaic River. Outfall 001 was for non-contact cooling water, which was pumped from the river, screened, used once and returned without treatment to the river. Outfall 002 was similar to 001, but included storm water and boiler blowdown (PAP-00433579).

A fact sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey (Permit No. NJ0000124) listed approximately 360,000 GPD of non-contact cooling water from the Salicylic Acid plant as discharged through a storm sewer to Outfall 001. Approximately 480,000 GPD of storm water and non-contact cooling water from the Salicylic Acid derivatives were discharged through Outfall 002. The following site map showing the outfall locations was dated October 15, 1989 (PAP-00206137, 40).



(PAP-00206140)

According to two PVSC Applications for a Sewer Connection Permit, dated May 5, 1986, and November 27, 1990, 340,078,600 gallons and 404,358,000 gallons, respectively, of cooling water were discharged to the Passaic River from January to December 1985 and October 1989 through September 1990, respectively (PAP-00206119-20; PAP-00016715-16).

An Industrial User Charge/Pretreatment Inspection Report stated an annual inspection was performed March 25, 1993. Meter readings for average daily water use were reported as 700,000 GPD of river water and 150,000 GPD of waste water. The report also stated contaminated storm water was treated and then discharged to the sewer, while uncontaminated water was discharged to the river (PAP-00206151, 53, 55)

Analytical results for each outfall were reported in an undated EPA form 3510 2C (Rev. 2-85). Concentrations of PAHs, PCBs, total lead, total copper, and total mercury were not detected in Outfall 001 (PAP-00433647-55), while total lead (15 µg/L) and total mercury (0.2 µg/L) were detected in Outfall 002 (PAP-00433658). The long-term average value for lead in the intake water was listed as 16 µg/L (PAP-00433649, 58).

6. Regulatory History/Enforcement Actions

Inspections

An Industrial User Charge/Pretreatment Inspection Report stated an annual inspection was performed March 25, 1993. Meter readings for average daily water use were reported as 700,000 GPD of river water and 150,000 GPD of waste water. The report also stated contaminated storm water was treated and then discharged to the sewer, while uncontaminated water was discharged to the river (PAP-00206151, 53, 55).

An Application for Certificate of Inspection by the Garfield Fire Department stated Hart Chemical Co. at the 290 River Drive location was inspected by the New Jersey Bureau of Fire Safety on December 15, 1988 (PAP-00433530-31).

A Right to Know Compliance inspection was conducted by the New Jersey Department of Health on September 14, 1992. The violations noted were all due to failure to label containers (PAP-00433862-65).

Violations

Violations were noted for Hart Chemical Co. at the facility based on a December 15, 1988, inspection by the New Jersey Bureau of Fire Safety. The violations included permits needed for the flammable and corrosive areas, and a diked area for the manufacturing area (PAP-00433532).

The PVSC sent a notice of violation on May 2, 1991, for non-COCs (chloroform and toluene) but these were noted by the facility to be sampling error and subsequent results showed compliance (PAP-00208805). Another PVSC notice of violation for permit 0949429 based on a non-COC (methylene chloride) was dated April 13, 1994 (PAP-00208813).

Permits

A letter from Kalama to the PVSC, dated December 21, 1982, stated that the Garfield, New Jersey, facility had been acquired by Kalama as of December 9, 1982, and discharged water under Sewer Connection Permit No. 0940722, which had been issued to Tenneco Chemicals, Inc. on January 23, 1981, and expired January 26, 1986 (PAP-00208804).

PVSC Sewer Connection Permit No. 09404292 was effective May 27, 1986, and expired May 27, 1991. Effluent limitations were defined for two outlets, 09404291-21040-0091 (discharge point No. 3) and 09404292-21040-0091 (discharge points No. 1 and 2), including a daily maximum for total lead of 690 µg/L and a maximum monthly average of 320 µg/L to be reported semiannually (PAP-00016682, 86-89, 90-92).

A letter to the PVSC from Kalama dated April 6, 1990, documented standard limits for discharge to the PVSC treatment plant. The total wastewater flow was 275,000 gallons per day, while flow from Kalama's OCPSF operations was 265,000 GPD. The limits for total lead were a daily maximum of 690 ppb (combined waste water formula application 665 ppb) and a monthly average of 320 ppb (combined waste water formula application 309 ppb) (PAP-00016700-02).

A letter from the NJDEP to Kalama, dated January 29, 1993, served as a final notice of termination of the New Jersey Pollutant Discharge Elimination System/Significant Indirect User (NJPDES/SIU) Permit (No. NJ0000124) to discharge pollutants into a delegated local agency's wastewater treatment plant, because the criteria for individual NJPDES/SIU permits did not apply to the facility (PAP-00016712).

NJDEP Permit No. NJ0000124 allowed discharge to the Passaic River, and was effective January 1, 1985, and expired December 31, 1989. According to the *Environmental Site Assessment, Phase I Property Transfer Report*, dated May 1994, Kalama submitted a renewal application to NJDEP, but it was still under review by NJDEP (PAP-00433807). Effluent limitations included copper (1.0 mg/L), but monitoring was only stated to be necessary if a corrosion inhibitor containing copper was used (PAP-00206157-58).

A 1989 fact sheet for Draft NJPDES Permit to Discharge into the Waters of the State of New Jersey (Permit No. NJ0000124) identified the two outfalls to the Passaic River. Limitations for non-COCs were specified and it was noted that the limitation on copper was removed because the facility informed NJDEP that they did not use copper (PAP-00206137, 44).

7. Response Actions

Characterization Activities

Numerous site characterization activities have taken place at the facility. The most significant reports include:

- *Environmental Assessments, Draft Report for B.C. Sugar*, dated September 3, 1991, prepared by Dames & Moore (PAP-00433539).
- *ECRA Investigation Report and Proposed Remedial Action Workplan, Volume I of IV*, dated December 1993 (ECRA Investigation Report), prepared by Geraghty & Miller, Inc. (PAP-00041187).
- *Environmental Site Assessment, Phase I Property Transfer Report*, dated May 1994, prepared by IT Corporation (PAP-00433767).
- *Revised Remedial Action Work Plan*, dated March 31, 1995 (PAP-00041624)

- *Revised Remedial Action Work Plan Addendum*, dated February 29, 1996, by SECOR International Inc. (PAP-00042155).
- *Remedial Investigation and Remedial Actions Report, Building 17 Former Sewer Lines*, dated February 26, 2003 (RI/RAR), by Sovereign Consulting Inc. (PAP-00044380).
- *Remedial Investigation Report and Remedial Action Work Plan for the Northern Phenol Area and Dowtherm DNAPL Areas,* dated February 13, 2004 (PAS-00008946).
- *Comprehensive Remedial Action Work Plan Addendum*, dated March 14, 2008, prepared by Sovereign Consulting Inc. (PAP-00046273).

Soil

Soil sampling was performed from 1986 through 1993 and summarized in the 1995 RAWP. The 1995 RAWP identified 28 AECs that generally included former locations of USTs (e.g., AECs 1, 3, 6, 10, and 11 contained fuel oil USTs), drum and scrap metal storage areas (AECs 19, 20, 21), production areas (AECs 14, 15, 16, 17), transformers (AECs 23, 24), and loading/unloading areas (AECs 24 through 28) (PAP-00041648-52).

According to the 1995 RAWP, PCBs were detected in site soil at AEC-24 (Transformer at Building 12) at a maximum of 2.2 mg/kg for Aroclor-1260 (PAP-00041882). In addition, according to the 2003 RI/RAR, PCBs were detected at 15.8 pm in one sample collected from the fill within the foundation walls of Building 17, but additional delineation samples did not detect PCBs (PAP-00044392-93).

The 1995 RAWP stated metal COCs were detected in soil at AEC-14, AEC-15, and AEC-18 as listed in the table below. Highest levels of metals contamination in soil were noted at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39). The 1996 RAWP Addendum attributed the lead concentration at AEC-15 to the presence of fill at the site (PAP-00042180).

Metal COCs Detected in Soil				
AEC	**Description**	**Copper**	**Lead**	**Mercury**
AEC-14	Benzoic Acid/ Benzaldehyde Production Area	7.8 mg/kg	(3.4 U)	(0.11 U)
AEC-15	Salicylic Acid/ Salicylate Production Buildings 10/36/39	550 mg/kg	820 mg/kg	18.6 mg/kg
AEC-18	Sewer Lines	190 mg/kg	446 mg/kg	0.68 mg/kg

U: Not detected
(PAP-00041871-73, 76)

PAHs were detected at most AECs, but concentrations were generally low, with the highest concentrations detected at AEC-15 (Salicylic Acid/Salicylate Production Buildings 10/36/39). The 1996 RAWP Addendum attributed these concentrations to the presence of fill at the site (PAP-00042179). The maximum concentrations of PAHs were detected as follows:

Maximum PAHs Detected in Soil Samples			
PAHs (ppm)	**S-2 at AEC-11**	**B-52-A at AEC-15**	**AEC-15-1C**
Anthracene	0.85	1.3	13.0
Benzo(a)anthracene	3.0	12.0	41.0
Benzo(a)pyrene	2.4	10.0	42.0
Benzo(b)fluoranthene	5.69	13.0	38.0
Benzo(ghi)perylene	0.96	3.0	43.0
Benzo(k)fluoranthene	NR	2.5	13.0
Chyrsene	4.0	12.0	45.0
Dibenzo(a,h)anthracene	NR	1.0	5.5
Fluoranthene	4.1	14.0	41.0
Fluorene	0.66 U	NR	1.8
Indeno(1,2,3-cd)pyrene	0.95	2.9	33.0
Naphthalene	2.8	0.12 J	0.27 J
Phenanthrene	3.4	4.6	39.0
Pyrene	6.91	20	260

NR: not reported J: estimated concentration U: not detected
(PAP-00041870, 72; PAP-00042265)

The 2003 RI/RAR identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Elevated PAHs were detected in mud from a concrete basin (AEC-32A) north of Building 17 (i.e., 6.1 ppm of benzo(a)anthracene; 4.45 ppm of benzo(b)fluoranthene; 3.04 ppm of benzo(k)fluoranthene; and 4.42 ppm of benzo(a)pyrene). It was stated that this basin drained sinks in the laboratory, but did not connect to a sewer and instead had vents to allow for evaporation (PAP-00044389-91).

Sewer

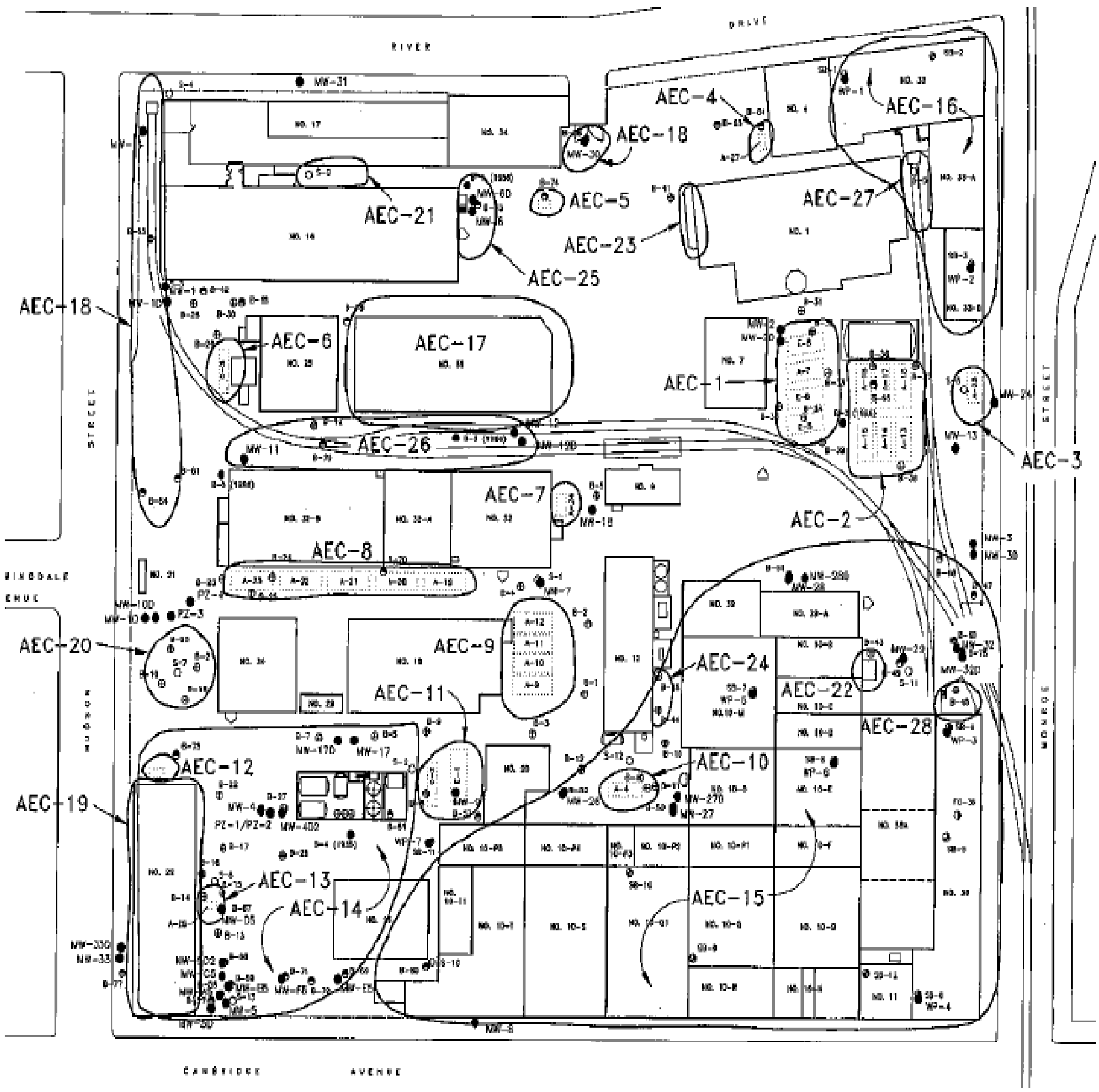
In the 1995 RAWP, AEC-18 was identified as the western portion of the sewer line that ran along Hudson Street to south, as well as the sewer outfall 002 near the main gate (PAP-00041651). Metals and PAHs were detected in soil samples collected along the sewer lines at maximum concentrations of 190 ppm copper (Sample B-55-Fill), 446 ppm lead (Sample B-54-Fill), and 0.68 ppm mercury (Sample B-54-Fill) (PAP-00041876).

The sewer lines from Building 17 (AEC-33), Building 32 (AEC-34), and Hudson Street (AEC-35) were removed in 2002. Maximum concentrations of metals in soil beneath the Building 17 line were 92.9 ppm copper, 132 ppm lead, and 15.5 ppm mercury. Soil samples collected at the Building 32 and Hudson Street sewer lines were not analyzed for metals, but PAH concentrations detected at Building 32 were attributed to fill material at the site. Approximately 110 tons, 756 tons, and 1,312 tons of soil were removed with each sewer line, respectively (PAP-00016753-56; PAP-00044401, 03-04, 13, 59).

Remedial Activities

The 1993 ECRA Investigation Report discussed five phases of ECRA-related investigations from 1986 to 1993 and the removal of 27 underground storage tanks during September 1987 to February 1990. In addition, an Administrative Consent Order (ACO) was executed between Kalama and NJDEP in December 1988 (PAP-00041518, 28-32).

The 1995 RAWP identified 28 AECs that generally included former locations of USTs (e.g., AECs 1, 3, 6, 10, and 11 contained fuel oil USTs), drum and scrap metal storage areas (AECs 19, 20, 21), production areas (AECs 14, 15, 16, 17), transformers (AECs 23, 24), and loading/unloading areas (AECs 24 through 28) (PAP-00041648-52).



(PAP-00041795; note north is to the right in this figure)

The 2003 RI/RAR identified additional AECs associated with the demolition of Building 17, the former laboratory and pilot plant. Fill was discovered within the foundation walls of the building and was analyzed for PCBs as part of the waste disposal characterization. PCBs were detected at 15.8 ppm in one soil sample, but additional delineation samples did not detect PCBs. An area of 19 feet by 27 feet was excavated to depth of 4 feet around the sample location (PAP-00044391-92).

This investigation also excavated a concrete trough with elevated metals concentrations located at Building 17, including an area of 12.5 feet by 60 feet and 5 feet deep and consisting of 216 tons of soil (PAP-00044395-97). After the trough was excavated in 2002, the loading dock between Building 16 and Building 17 was investigated. Fill material consisting of crushed rock, brick, wood chips, and glass was found beneath the loading dock. The fill was 1 foot thick, while the native soil beneath consisted of a fine sandy silt. A sample from the fill material contained 42,000 ppm lead, while the native soil beneath this location detected lead at 35.9 ppm. Approximately 166 tons of soil were removed from this area in 2002 (PAP-00044397-99, 457).

The sewer lines from Building 17 (AEC-33), Building 32 (AEC-34) and Hudson Street (AEC-35) were removed in 2002. Maximum concentrations of metals in soil beneath the Building 17 sewer line were 92.9 ppm copper, 132 ppm lead, and 15.5 ppm mercury. The soil along the Building 17 sewer line consisted of crushed stone/slag fill material underlain by sand, silt, and silty sands. Approximately 110 tons, 756 tons, and 1,312 tons of soil were removed with each sewer line, respectively (PAP-00044401, 04, 13).

The 2008 Comprehensive RAWP stated no further action (NFA) was approved by NJDEP for the following AECs in a letter dated September 6, 1995: AEC-1 through 8, 10, 16, 22, 23, 25, 27, and 28. It was also stated that AEC-31 received NFA approval on June 18, 2002, and AEC-32A, 32B, 32C, 32D, 33, 34, and 35 were approved for NFA by NJDEP on October 21, 2003 (PAP-00323694-702, 708, 729, 737-739, 741-742, 749-766).

A letter from NJDEP dated December 30, 2008 approved NFA for the following AECs: 9, 12, 13, 15, 17, 18, 19, 20, 21, 26, and 32A. The letter stated a site-wide cap engineering control was required due to the presence of contaminated historic fill at the site (PAP-00324631).

8. Summary of Asserted Defenses

Goodrich asserts that to the extent it is claimed that PAHs from released petroleum products impacted the River, such discharges are excluded from CERCLA by the petroleum exclusion at 42 USC 9601(14). To the extent it is claimed that PAHs impacted the River, Respondent also intends to assert a transport and fate defense.

NEWELL BRANDS INC. (f/k/a Newell Rubbermaid Inc.)

Facility Name, Address and Size: Goody Products, Inc. (formerly known as H. Goodman & Sons, Inc.) 969 Newark Turnpike, Kearny, New Jersey 07032.[1] Approximately 10.3 Acres (PAP-00104322). In a Pollutant Discharge form dated December 1975, the plant reported 300 employees. In a July 24, 1991, Sewer Connection Application, the plant reported 300 full-time employees with two shifts per day (PAP-00103450; PAP-00105520). A Community Right To Know Survey for 1991 completed by Goody Products, Inc. reported 320 employees (PAS-00002034).

1. **Business Type:** Manufacturer of nickel-plated hair care accessories (PAP-00104322).

2. **Time Period of Ownership/Operations**

Operator: ~1968 to May 13, 1994 (PAP-00103485; PAP-00104911; PAP-00104832; PAP-00105268; PAS-00001863)
Owner: Jeryl Industries, Inc., from pre-1969 to at least 1996 (PAS-00001835; PAS-00002050)

H. Goodman & Sons, Inc. leased the Site from Jeryl Industries, Inc. on May 26, 1966 (PAP-00350468; PAS-00002050-89). On January 2, 1976, H. Goodman & Sons, Inc. filed a Restated Certificate of Incorporation (PAS-00002091-98). The corporate name was changed to Goody Products, Inc. on May 22, 1980, according to a Certificate of Amendment of Certificate of Incorporation of H. Goodman & Sons, Inc. (PAS-00002099-104). Note: A 1996 Assignment and Assumption of Lease stated the name was changed to Goody Products, Inc. on June 2, 1982 (PAP-00350469). Goody Products became a wholly owned subsidiary of Newell Company by a stock purchase of August 2, 1993 (PAP-00350690; PAS-00001867). According to the 1997 Response to Request for Information completed by Newell Company, Goody Products operated at the facility for approximately 25 years from approximately 1968 to 1994. Operations at the site ceased in May 1994 (PAP-00104911; PAP-00104832; PAP-00105268; PAS-00001863).

On June 15, 2018, the stock of Goody Products, Inc. was transferred from Newell Brands Inc. (f/k/a Newell Rubbermaid Inc., f/k/a Newell Co.), through a series of internal contributions, ultimately to its wholly owned indirect subsidiary Sunbeam Diversified Holdings LLC, a Florida limited liability company. On August 31, 2018, Newell Brands Inc. assumed the liability of Goody Products, Inc., if any, in connection with the Diamond Alkali Superfund Site arising from alleged discharges from the past operation of the Facility by Goody Products, Inc. (PAP-00718033; PAP-00718036). On that same day, Newell Brands Inc. then caused the sale of the stock of Goody Products, Inc. from Sunbeam Diversified Holdings LLC to GP Midco, L.L.C., a Delaware limited liability company that is unrelated to Newell Brands Inc. (PAP-00717943, 54-57). Newell

[1] The property where the Goody Products, Inc. facility was located was commonly known as 969 Newark Turnpike. Google Maps currently lists the property's address as 969 Newark-Jersey City Turnpike.

Brands Inc. further agreed to indemnify Goody Products, Inc. for that assumed liability (PAP-00717954-57, PAP-00718033-4, PAP-00718036).[2]

3. Operational History/COC Use and Presence at the Facility

According to the 1997 Response to Request for Information completed by Newell Company, the products manufactured at the facility were hair barrettes, and other metal hair accessories such as pins. Base metals such as steel, stainless steel, and aluminum were purchased and processed to make the final products. These base metals contained variable amounts of aluminum, iron, and chromium. The manufacturing processes to make the final products included stamping and forming to obtain semi-finished metal parts which were heat-treated and annealed. This process utilized oils. Metal parts were also subjected to burnishing or polishing. Scale removal involved acid and caustic water mixtures. Certain products underwent dry process metallizing with aluminum. Electroplating of nickel onto steel from an acid solution of nickel ions was also conducted. Some zinc plating from cyanide solutions may also have taken place. Lacquer coating of metal parts that utilized thinners containing ethylbenzene, toluene, and xylene also occurred. Hazardous wastes were generated as a result of the manufacturing processes (PAP-00103473; PAS-00001864).

Goody Products operated under NJPDES discharge permit No. NJ0029505, which granted the company permission to discharge to Dead Horse Creek. The permit was issued June 2, 1984, and effective August 1, 1984, and had an expiration date of July 31, 1989 (PAP-00350677; PAS-00001878). Contaminants to be monitored under this permit included lead and copper, with daily discharges of each not to exceed 0.1 mg/L; and oil and grease, with daily discharge not to exceed 20 mg/L (PAS-00001891). Note: PAHs may be present in oils.

According to the 1983 Public Notice for the issuance of draft NJPDES permit No. NJ0029505, there were two existing surface water discharge outfalls at the Goody Products facility. Discharge 001 was industrial process wastewater generated from various metal finishing operations that would receive treatment consisting of equalization, neutralization, flocculation, clarification, and filtration. Discharge 002 was sanitary wastewater which received treatment consisting of primary settling, aeration, secondary settling, and chlorination (PAP-00105420; PAP-00105440-41).

A Discharge Monitoring Report from July 1989 stated that a new Industrial Process Waste Water Treatment Plant was installed in July (PAP-00446234-37). In August 1989, it was reported that Goody Products was adjusting and debugging the new treatment system. The old treatment system, which was being used for neutralization of alkaline cleaners, appears to be the source of unexpected nickel, cadmium and lead residues, thereby contributing to exceedances (PAP-00446296).

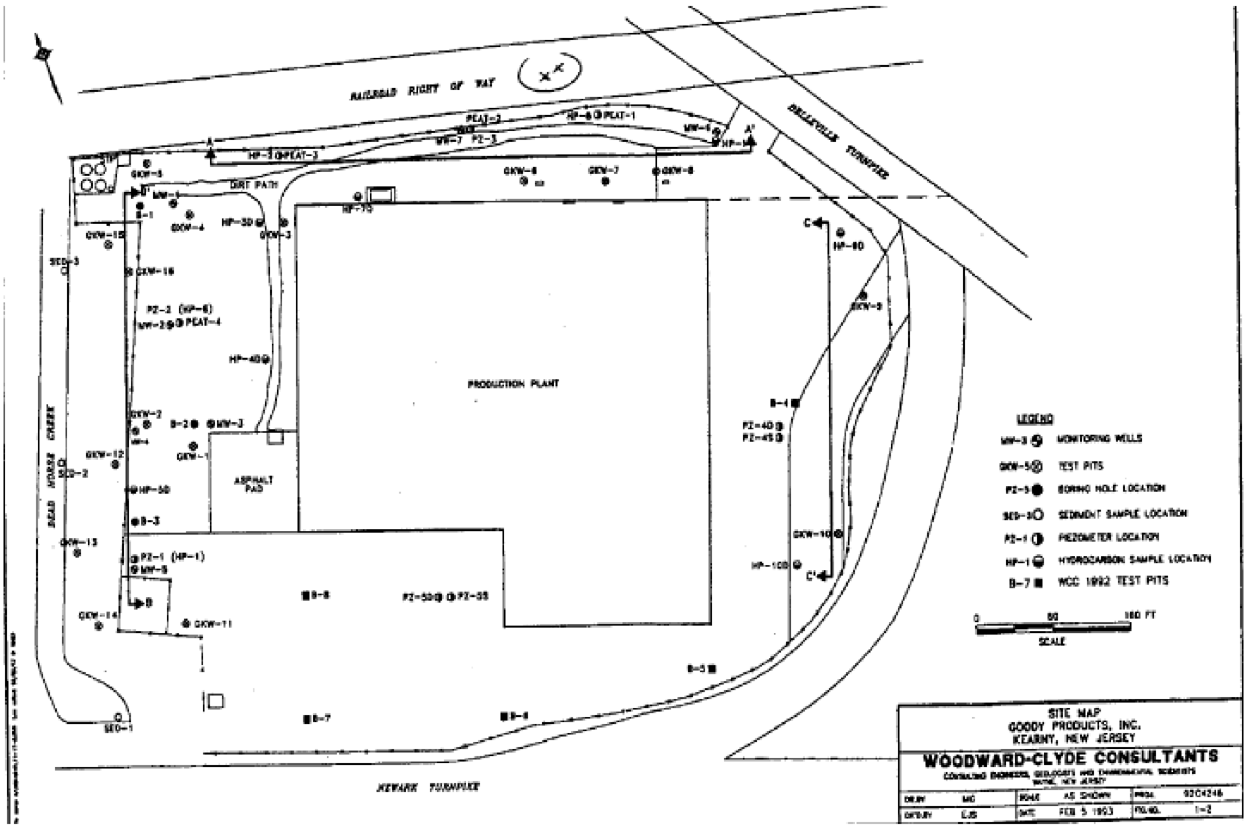
[2] This Report was revised to include documents received on June 15, 2020. The additional documents did not change Newell Brands Inc.'s previous certification

A Community Right-to-Know Survey for 1991 completed by Goody Products states that Goody Products' nature of business included manufacturing, assembly, and warehousing of hair care accessories (PAS-00002034).

The 1991 Survey shows areas where chemicals were stored. This included: The tool room; boiler room; plating room; maintenance department; warehouse; metalizing-stripping room; waste treatment area; waste storage area; and, outside sanitary sewer treatment plant. Chemicals listed included among others, waste oils, acetone, acetylene, naphtha solvent, kerosene, hydrogen peroxide, hydrochloric acid, ferrous sulfate, sodium hydroxide, sulfuric acid, sodium bisulfite, sodium hypochlorite, nickel plugs and nickel compounds, 2-butoxyethanol, and ammonia (PAS-00002035-43).

A map included with the June 1993 report *Results of Field Investigation and Review of Remedial Options* (included below) prepared by Woodward-Clyde Consultants for Goody Products shows the location of the production plant in relation to Dead Horse Creek to the west. According to the map at the end of this section the sanitary wastewater treatment plant was located in the northwestern corner of the facility (PAS-00001945; PAS-00001959).

Newell Company stated in the 1997 *Response to Request for Information* that there was no further discharge by Goody Products personnel from the treated sanitary wastewater outfall (002A) after the property was vacated in October 1994. No flow reports were filed with the New Jersey Department of Environmental Protection (NJDEP) until August 1996 (PAS-00001863; PAS-00001876-77). In 1994 and 1995, all hazardous waste generated at Goody Products was disposed of at off-site facilities (PAS-00001911-26; PAS-00001930-43). Hazardous wastes disposed of in 1994 included filter cake from metals treatment of wastewater, and rinse and wash water from electroplating (PAS-00001911-26). Note: It was stated in the *Response to Request for Information* that the site was vacated in October 1994 and confirmed in a waste report that manufacturing operations ceased May 13, 1994 (PAS-00001929). The last shipments of hazardous waste from the facility were on August 14, 1995 (PAS-00001930-43).



4. Identified COCs

- PAHs (potentially used and detected
- Copper (used)
- Lead (used)
- Mercury (released)

PAHs

Newell stated in the 1997 Response to EPA Request for Information that PAHs may be present in heating fuel oil, lubricating oils, and heat quench oil (PAS-00001864). Fuel Oil No. 4 was stored in a 10,000-gallon underground storage tank (UST) located in the northern portion of the Goody site. The tank was removed in February 1990 (PAP-00105060; PAP-00350612).

Following the excavation, confirmation samples were collected from the sidewalls. Five base-neutral compounds (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene) were detected in the deeper sample obtained from the southern sidewall (PAP-00105061). The total concentration of the PAHs was 7.34 mg/kg, which is below the cleanup guideline of 10 mg/kg (PAP-00350625). A 1990 Report on UST Removal found that soil remediation was not necessary following UST removal because elevated petroleum hydrocarbon concentrations were attributable to historic fill (PAP-00350612-13). A October 1994

Preliminary Remedial Investigation Workplan concluded the presence of PAHs was attributable to historical urban fill materials placed at the site in conjunction with site development, and no further action was proposed with regard to the 10,000 gal. UST (PAP-00105061). Soil, surface water, and groundwater sampling on the site and within Dead Horse Creek has detected several PAHs (PAS-00002018-19; PAS-00002021-22; PAS-00002024-25; PAP-00104829-97; PAP-00104783-801).

Copper

According to the May 1972 Waste Effluent Survey conducted for Passaic Valley Sewerage Commissioners, some materials used at the facility contained metals and metal alloys (brass and white metal) (PAP-00350464). Brass contains copper (PAP-00350483). The white metal may have contained copper (PAP-00350467; PAP-00103466; PAP-00350478-508; PAP-00350509-10). The type of white metal used by the facility and its chemical composition is not known. The 1972 Waste Effluent Survey reported a concentration of copper of 1,675 micrograms per liter (µg/L) in the facility's industrial wastewater (PAP-00350467).

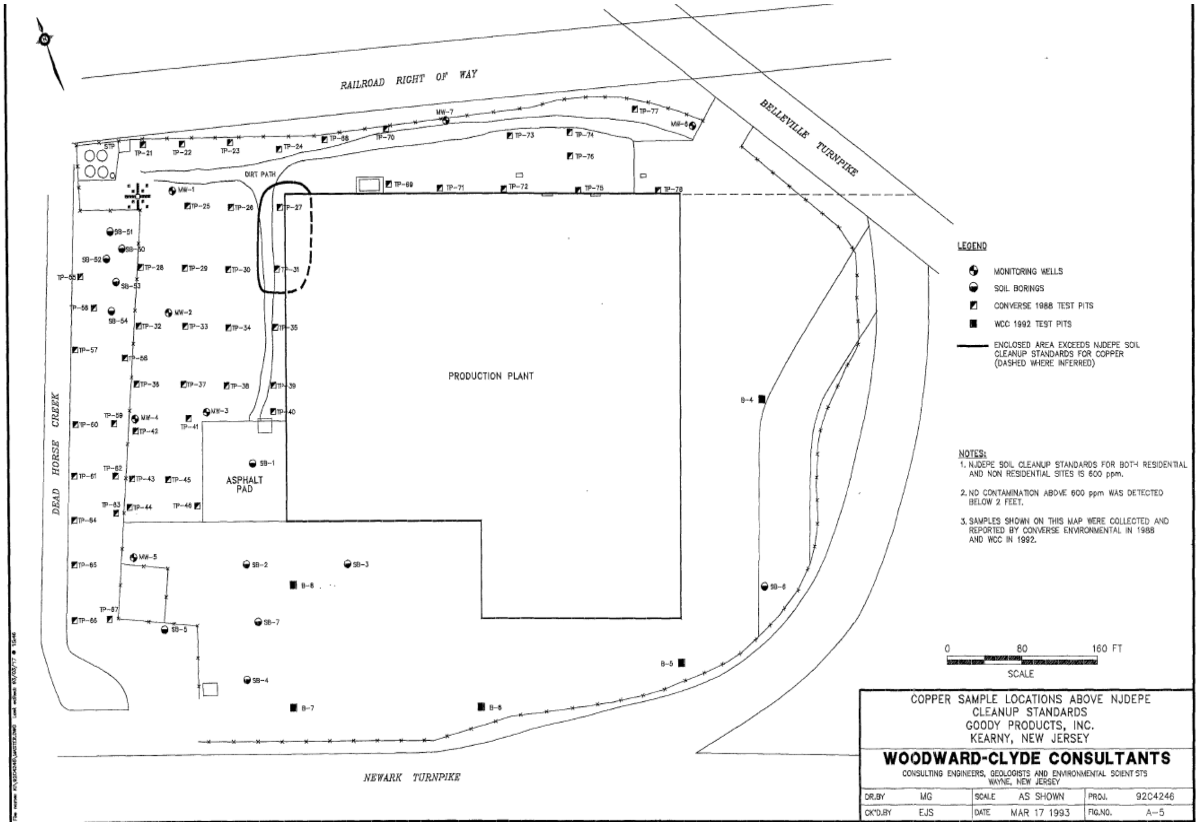
According to a NJDEP memorandum dated February 11, 1976, field samples collected on three different occasions in June 1975 and in September 1975 from two-inch discharge hoses emanating from the rear of H. Goodman & Sons, Inc., premises and discharging to the ground revealed excessive heavy metals parameters (PAP-00105499). The concentration of copper in these samples ranged from 105 µg/L to 430 µg/L (PAP-00105511-13). In addition, the samples collected on June 5 and 12, 1975 had low pH readings of 2.7 and 2.3, respectively (PAP-00105511-12). It appears that as of 1983, the Facility was no longer using brass or white metal (PAP-00105322).
In the 1997 Response to EPA's Request for Information, Newell stated that it received, utilized, manufactured, discharged, released, stored or disposed of materials containing copper at the Goody Products facility included (PAS-00001863-64).

According to a December 17, 1976 Regarding Aeration Studies, the Facility's industrial wastewater discharges contained copper (PAP-00104750; PAP-00104753).

A 1979 treatability study of facility wastewater noted pretreatment levels of copper of 0.19 mg/l; and post treatment levels of copper of 0.03 mg/l (PAP-00105365 According to the NJPDES permit application materials from 1991, copper was known to be present in the facility's discharge (PAP-00103466).

Soil, surface water, and groundwater sampling on the site and within Dead Horse Creek has detected copper (PAS-00001965-69; PAS-00001973-76 PAS-00001994-96; PAP-00104185-88;; PAP-00104829-97; PAP-00104783-801;).

The June 1993 Results of Field Investigation and Review of Remedial Options prepared by Woodward-Clyde Consultants for Goody Products included maps delineating the locations of the contaminants which exceeded New Jersey Department of Environmental Protection and Energy (NJDEPE) residential and non-residential soil cleanup standards. The following map shows the area where copper exceeded cleanup standards:



(PAP-00103569)

Discharge Monitoring Reports for Industrial Process Wastewater discharges (Discharge 001) from 1984 through 1994 reported numerous detections for copper (PAP-00446408-735).

Lead

According to the May 1972 Waste Effluent Survey, white metal was used at the facility (PAP-00350464). The white metal may have contained lead (PAP-00350478-508). The type of white metal used by the facility and its chemical composition is not known. It appears that as of 1983, the facility was no longer using brass or white metal (PAP-00105322). Lead was not reported in the chemical testing results recorded in the 1975 New Jersey Department of Health Stream or Wastewater Analysis (PAP-00105511-13).

A 1979 treatability study of facility waste water noted pretreatment levels of lead of 6.40 mg/l; and post treatment levels of lead of 0.40 mg/l (PAP-00105365). In other instances, such as in 1983 and 1991, lead was not detected in facility wastewater discharges (PAP-00105310). According to the NJPDES permit application materials from 1991, lead was suspected to be absent from the facility's discharges (PAP-00103466).

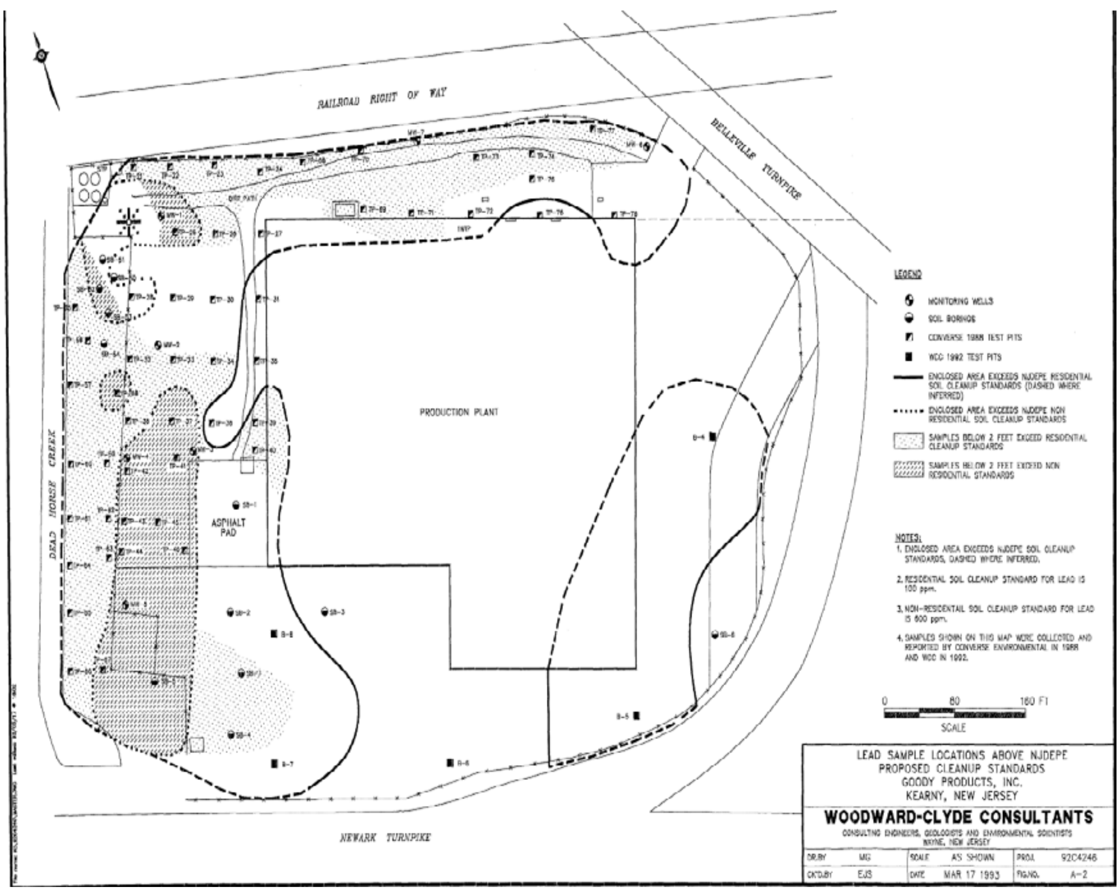
In the 1997 Response to EPA's Request for Information, Newell stated that it received, utilized, manufactured, discharged, released, stored or disposed of materials containing lead at the Goody Products facility (PAS-00001863-64).

Discharge Monitoring Reports for Industrial Process Wastewater discharges (Discharge 001) from 1984 through 1994 reported numerous detections for lead (PAP-00446408-735).

Soil, surface water, and groundwater sampling on the site and within Dead Horse Creek has detected lead, (PAS-00001965-79; PAS-00001994-96; PAS-00002009; PAS-00002016-17; PAS-00002023; PAP-00104156; PAP-00104185-98; PAP-00104829-97; PAP-00104783-801).

In 2002, NJDEP accepted information provided by Killam that lead in groundwater is associated with historic fill. Based on the presence of lead in groundwater in both process and non-process areas of the property, and on the fact that lead is a common constituent of fill materials, NJDEP accepted that the lead in groundwater is associated with the historic fill on the property and required no further delineation for lead in groundwater (PAP-00105242).

The following map from the June 1993 Results of Field Investigation and Review of Remedial Options shows areas where lead exceeded cleanup standards:



(PAP-00103563)

Mercury

Mercury was not reported in the chemical testing results recorded in the 1975 New Jersey Department of Health Stream or Wastewater Analysis (PAP-00105511-13) or in a 1979 wastewater treatability analysis (PAP-00105365). A 1979 NPDES Permit Application Form states that mercury was not present in wastewater (PAP-00105310). According to the NJPDES permit application materials from 1991, mercury was suspected to be absent (PAP-00103466).

Soil, surface water, and groundwater sampling on the site and within Dead Horse Creek detected mercury, (PAS-00001994-96; PAP-00104166; PAP-00104173; PAP-00104175; PAP-00104829-97; PAP-00104783-801).

In 2002, NJDEP Bureau of Groundwater Pollution Assessment (BGWPA) accepted Newell's conclusions that the mercury in the surface water did not originate from the facility (PAP-00105250). According to a 2003 memo from the BGWPA, mercury was not identified above the standard in the shallow wells proximate to Dead Horse Creek or in any other shallow wells at the site. Therefore, the BGWPA concluded that mercury in Dead Horse Creek probably originated from an off-site source (PAP-00105243).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.[3]

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.[4] Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.[5] PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.[6]

[3] *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).
[4] *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.
[5] New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation,* Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].
[6] NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	**Max Detected Concentration**
Lead	13,572 mg/kg
Copper	2,550 mg/kg
Mercury	11.2 mg/kg
Benzo(a)anthracene	49 mg/kg
Benzo(a)pyrene	48 mg/kg
Benzo(b)fluoranthene	63 mg/kg
Benzo(k)fluoranthene	24 mg/kg
Dibenzo(a,h)anthracene	8.6 mg/kg
Indeno(1,2,3-cd)pyrene	31 mg/kg

Available documentation and information suggests the soil samples were taken from areas containing historic fill materials. According to the Report of Environmental Record Check and Review prepared by S&S Environmental Sciences, Inc. for Jeryl Industries, Inc., dated May 24, 1994, the site was previously undeveloped marshland, which was reclaimed for construction before 1968 with fill material (PAP-00103480). The entirety of the site is located on historic fill material starting from the surface and going to a depth of 9.5 feet below grade (PAP-00105254-255). Investigation by Killam in connection with the Industrial Site Recovery Act (ISRA) process confirmed the presence of fill material throughout the property (PAP-00104915). During sampling at the facility, the presence of fill material was noted at all interior and exterior sample locations (PAP-00104918, 41).

Documentation and information also suggests sediment samples included historic fill material. According to Hatch Mott MacDonald, Jeryl Industries created the current surface water feature (i.e., Dead Horse Creek) as part of the property's development in the late 1960s. The linear, channelized water body currently present at the property was believed to have been created both through the removal of indigenous soil material and emplacing fill materials from an off-site source to form the bedding of the channel (PAP-00104787).

There is no indication from a review of provided documents that facility operations disturbed contamination located in historic fill.

Further, according to S&S Environmental Sciences, Inc.. report, \ the background sampling and testing conducted at the site since 1988 stated that the fill materials used at the site also contain some of the pollutants (metals and organics) also used and/or discharged by Goody Products. However, due to S&S Environmental Science's conclusion that long-term use of hazardous substances and generation of hazardous wastes by Goody Products during its operation, combined with periodic on-site disposal and/or spills of hazardous substances/wastes, it was their opinion that the operations of Goody Products have had significant adverse environmental impact on the property soils and groundwater (PAP-00103476; PAP-00103485). Notably, the S&S report was

prepared while a suit was pending between Jeryl Industries, Inc. and Goody Products, and the report's author was later designated in the suit as an expert for Jeryl Industries, Inc. (PAP-00402669; PAP-00402673).

5. COC Pathways

Sanitary Sewage

Goody Products operated a sanitary sewage treatment plant at the northwestern corner of the facility. The plant included four below-grade cylindrical tanks and a control building. Effluent discharge was to Dead Horse Creek, located immediately adjacent, and to the west, of the plant (PAP-00103326; PAP-00104611).

Available references include information on the sanitary sewage treatment plant at the site, but do not include specific information regarding COCs that may have entered the system or been discharged through it. Correspondence from May 4, 1970, provided a response to a March 31, 1970, surveillance report concerning an incident where the chlorine contact tank was overflowing due to the receiving stream (Dead Horse Creek) being blocked, raising the level of the creek and backing up onto Plant property (PAP-00351060-61). NJDEP Discharge Surveillance Reports dated October 18, 1979 similarly described the chlorine contact tank as being flooded by receiving stream backup (PAP-00351068).

A Plant Diagram and Flow Sequence included with a NJDEP Plant Inspection and Status Report Form dated August 23, 1983 shows the sanitary wastewater to flow to the treatment plant and then to Dead Horse Creek (PAP-00105320-22).

An application for EPA permit to discharge wastewater, dated January 26, 1989, listed the average flow through outfall 002 as 9,000 gallons per day (PAP-00717921, 24).[7]

Correspondence dated November 13, 1989, described the sewage treatment plant as a compact, activated sludge return, package unit. It was designed to handle 100,000 gallons per day. The normal processing is 15,000 gallons per day. Sludge generated at the contact aerator is return-pumped back to a primary settling tank for recycling. Sludge is not routinely removed from the system and it had been several years since anything had been removed from any tank (PAP-00446792; PAP-00446953). It was stated that Goody Products does not produce sludge on a daily basis and they pump out the system only when maintenance dictates so. In September 1989, the entire system was completely pumped out to perform maintenance work (PAP-00446793; PAP-00446954). In April 1989, a sample of the slurry was taken from the bottom of the primary settling tank for analysis (PAP-00446792). The reported results included copper at 2.45 mg/L, lead at 0.6 mg/L, and oil and grease at 528 mg/L (PAP-00446797-98).

[7] This Report was revised to include documents received on June 15, 2020. The additional documents did not change Newell Brands Inc.'s previous certification.

Correspondence dated May 29, 1990, reported that Goody Products had no sludge wasting capabilities built into their treatment systems. They did not have thickening tanks, dewatering equipment, incinerator, or removal pumps. If they desired to waste or remove sludge, they would call a commercial vacuum to suction directly from their digester (PAP-00447846-47).

Numerous Domestic Wastewater Sludge Reports reported copper and lead and in some cases mercury. The domestic sludge waste was disposed of by off-site incineration (PAP-00446844; PAP-00448131; PAP-00447543-45, 641, 841).

Industrial Wastewater

The volume of industrial wastewater discharged through outfall 001 to Dead Horse Creek was an average of 25,000 gallons per day with a maximum of 40,000 gallons per day, according to an application for EPA permit to discharge wastewater, dated January 26, 1989. The wastewater was discharged five days per week and twelve months per year (PAP-00717922, 24). This application also reported concentrations for the industrial effluent of 0.1 mg/L copper and 0.1 mg/L lead. PAHs were not detected in the one industrial effluent sample collected (PAP-00717925-33).[8]

In addition to other non-COC pollutants, the industrial wastewater from discharge Outfall 001 has been reported to contain copper and lead (PAP-00350678; PAP-00446368-76).

A memo from the NJDEP dated February 9, 1988, reported that before the installation of the computerized industrial treatment system about four years prior, untreated industrial waste water was discharged to the ground. The computerized treatment system reportedly had never worked as planned and excessive nickel above Permit limits was being discharged at that time. NJDEP noted that the treatment system may need in house design changes (PAP-00105285). NJDEP also noted that Goody Products would need a Discharge to Groundwater Permit for past and present use. A minimum of four monitoring wells would be required, one upgradiant and three downgradiant. If the groundwater monitoring results were acceptable, Goody Products may not have been required to renew the Groundwater Permit after five years (PAP-00105285-86).

The following results for Industrial Process Wastewater discharges (Discharge 001) at Goody Products, Inc. were reported on monthly Discharge Monitoring Reports and/or in the May 1990 New Jersey Pollution Discharge Elimination System Discharge to Groundwater Permit Application:

Monthly Discharge Monitoring Reports					
Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
September 1984	78 mg/L	0.04 mg/L	0.1 mg/L	No analysis reported	PAP-00446411-12

[8] This Report was revised to include documents received on June 15, 2020. The additional documents did not change Newell Brands Inc.'s previous certification.

Monthly Discharge Monitoring Reports					
Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
October 1984	15 mg/L	0.04 mg/L	0.1 mg/L	No analysis reported	PAP-00446418-19
November 1984	21 mg/L	0.3 mg/L	0.4 mg/L	No analysis reported	PAP-00446424-25, 29-30
December 1984	22 mg/L	0.01 mg/L	0.05 mg/L	No analysis reported	PAP-00446433-34
January 1985	12 mg/L	0.06 mg/L	0.02 mg/L	No analysis reported	PAP-00446437-38
February 1985	16 mg/L	Not detected	0.9 mg/L	No analysis reported	PAP-00446441-42
March 1985	23 mg/L	0.05 mg/L	0.05 mg/L	No analysis reported	PAP-00446446-47
April 1985	32 mg/L	0.02 mg/L	0.1 mg/L	No analysis reported	PAP-00446449-50
May 1985	39 mg/L	0.08 mg/L	0.09 mg/L	No analysis reported	PAP-00446453-54
June 1985	31.5 mg/L	0.07 mg/L	0.08 mg/L	No analysis reported	PAP-00446457-58
July 1985	24 mg/L	0.08 mg/L	0.15 mg/L	No analysis reported	PAP-00446461-62
August 1985	7.1 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446465-66
September 1985	7.4 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446469-70
October 1985	3.9 mg/L	0.009 mg/L	0.004 mg/L	No analysis reported	PAP-00446474-75
November 1985	10.5 mg/L	0.04 mg/L	Not detected	No analysis reported	PAP-00446478-79
December 1985	16 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446483-84
January 1986	18.3 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446487-88
February 1986	8.0 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446491-92
March 1986	3.1 mg/L	Not detected	Not detected	No analysis reported	PAP-00446495-96
April 1986	7.0 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446499-500
May 1986	8.2 mg/L	0.05 mg/L	Not detected	No analysis reported	PAP-00446745-47; PAP-00446503-04
June 1986	4.2 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446740-42; PAP-00446507-08
July 1986	5.6 mg/L	Not detected	Not detected	No analysis reported	PAP-00446736-38; PAP-00446511-12
August 1986	126 mg/L	0.25 mg/L	Not detected	No analysis reported	PAP-00446515-16
September 1986	10.3 mg/L	0.08 mg/L	Not detected	No analysis reported	PAP-00446751-53; PAP-00446519-20

Monthly Discharge Monitoring Reports					
Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
October 1986	23 mg/L	0.08 mg/L	Not detected	No analysis reported	PAP-00446523-24
November 1986	31 mg/L	0.06 mg/L	Not detected	No analysis reported	PAP-00446527-28
December 1986	39 mg/L	0.05 mg/L	Not detected	No analysis reported	PAP-00446531-32
January 1987	48 mg/L	0.03 mg/L	Not detected	No analysis reported	PAP-00446535-36
February 1987	4.5 mg/L	Not detected	0.05 mg/L	No analysis reported	PAP-00446539-40
March 1987	18 mg/L	0.08 mg/L	0.05 mg/L	No analysis reported	PAP-00446543-44
April 1987	8.4 mg/L	Not detected	0.10 mg/L	No analysis reported	PAP-00446547-48
May 1987	8.6 mg/L	Not detected	0.04 mg/L	No analysis reported	PAP-00446551-52
June 1987	16.4 mg/L	0.05 mg/L	0.08 mg/L	No analysis reported	PAP-00446555, 57
July 1987	12 mg/L	0.10 mg/L	0.08 mg/L	No analysis reported	PAP-00446559
August 1987	18.0 mg/L	0.06 mg/L	0.05 mg/L	No analysis reported	PAP-00446563-64
September 1987	8.4 mg/L	0.08 mg/L	0.05 mg/L	No analysis reported	PAP-00446567-68
October 1987	1.2 mg/L	0.08 mg/L	0.10 mg/L	No analysis reported	PAP-00446571-72
November 1987	1.9 mg/L	0.05 mg/L	0.02 mg/L	Not detected	PAP-00446575-81
December 1987	6.8 mg/L	0.08 mg/L	Not detected	Not detected	PAP-00446584-91
January 1988	4.0 mg/L	0.08 mg/L	0.05 mg/L	Not detected	PAP-00446399-407; PAP-00446592-93
February 1988	12.6 mg/L	0.10 mg/L	0.06 mg/L	Not detected	PAP-00446390-98; PAP-00446596-604
March 1988	14.8 mg/L	Not detected	Not detected	Not detected	PAP-00446377-86; PAP-00446605-14
April 1988	14.5 mg/L	0.06 mg/L	0.12 mg/L	Not detected	PAP-00446368-76; PAP-00446615-23
May 1988	12.9 mg/L	0.05 mg/L	0.06 mg/L	Not detected	PAP-00446359-67; PAP-00446624-32
June 1988	9.7 mg/L	0.09 mg/L	0.01 mg/L	Not detected	PAP-00446350-58; PAP-00446633-41
July 1988	0.10 mg/L	0.10 mg/L	0.10 mg/L	Not detected	PAP-00446341-49; PAP-00446642-50
August 1988	3.8 mg/L	Not detected	Not detected	Not detected	PAP-00446325-40; PAP-00446651-58
September 1988	0.1 mg/L	0.3 mg/L	0.10 mg/L	Not detected	PAP-00446316-24; PAP-00446659-66

Monthly Discharge Monitoring Reports					
Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
October 1988	0.1 mg/L	0.1 mg/L	0.1 mg/L	Not detected	PAP-00446307-15; PAP-00446667-75
November 1988	8.4 mg/L	0.12 mg/L	0.09 mg/L	No analysis reported	PAP-00446303-05; PAP-00446676-81
December 1988	10.0 mg/L	0.03 mg/L	Not detected	No analysis reported	PAP-00446299-301; PAP-00446682-87
January 1989	2.0 mg/L	0.06 mg/L	0.07 mg/L	No analysis reported	PAP-00446688-89
February 1989	3.2 mg/L	0.06 mg/L	0.09 mg/L	No analysis reported	PAP-00446692-93
March 1989	3.8 mg/L	0.03 mg/L	0.05 mg/L	No analysis reported	PAP-00446696-97
April 1989	4.8 mg/L	0.08 mg/L	0.09 mg/L	No analysis reported	PAP-00446700-01
May 1989	9.6 mg/L	0.04 mg/L	Not detected	No analysis reported	PAP-00446704-05
June 1989	4.8 mg/L	0.24 mg/L	0.09 mg/L	No analysis reported	PAP-00446708-09
July 1989	13.0 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446234-37; PAP-00446712-13
August 1989	7.2 mg/L	0.02 mg/L	0.18 mg/L	No analysis reported	PAP-00446292-95; PAP-00446716-17
September 1989	140 mg/L	Not detected	Not detected	No analysis reported	PAP-00446229-33; PAP-00446719-20
October 1989	1.6 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446724-25
November 1989	4.8 mg/L	0.02 mg/L	Not detected	No analysis reported	PAP-00446728-29
December 1989	16 mg/L	0.03 mg/L	Not detected	No analysis reported	PAP-00446732-33
January 1990	10.0 mg/L	0.02 mg/L	0.06 mg/L	No analysis reported	PAP-00446227-28
February 1990	14.0 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446261-63
March 1990	21 mg/L	0.05 mg/L	0.07 mg/L	No analysis reported	PAP-00446250-52
May 1990	13.0 mg/L	Not detected	Not detected	No analysis reported	PAP-00446050-53; PAP-00446246-48
June 1990	3.2 mg/L	Not detected	0.03 mg/L	No analysis reported	PAP-00446221-23
October 1990	3.4 mg/L	0.04 mg/L	0.17 mg/L	No analysis reported	PAP-00446217-19
January 1991	13.0 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446242-44
February 1991	Not detected	0.15 mg/L	Not detected	No analysis reported	PAP-00446213-15; PAP-00446238-39
October 1991	4.2 mg/L	0.005 mg/L	Not detected	No analysis reported	PAP-00446209-11

Monthly Discharge Monitoring Reports					
Monitoring Period	**Oil and Grease**	**Copper**	**Lead**	**PAHs**	**Citation**
February 1992	18 mg/L	0.02 mg/L	0.1 mg/L	No analysis reported	PAP-00446205-07
June 1992	4.8 mg/L	Not detected	Not detected	Not detected	PAP-00446191-204
July 1992	10 mg/L	0.02 mg/L	0.03 mg/L	No analysis reported	PAP-00446185-87
August 1992	9.2 mg/L	Not detected	0.03 mg/L	No analysis reported	PAP-00446178-82
September 1992	17 mg/L	Not detected	Not detected	No analysis reported	PAP-00446172-74
November 1992	0.8 mg/L	Not detected	0.01 mg/L	Not detected	PAP-00446279-91
December 1992	4.4 mg/L	0.03 mg/L	0.07 mg/L	No analysis reported	PAP-00446168-70
January 1993	8.0 mg/L	0.01 mg/L	0.03 mg/L	Not detected	PAP-00446154-67
February 1993	9.2 mg/L	0.01 mg/L	Not detected	No analysis reported	PAP-00446141-53
March 1993	4.0 mg/L	0.03 mg/L	0.02 mg/L	No analysis reported	PAP-00446135-40
May 1993	16.0 mg/L	0.03 mg/L	0.05 mg/L	No analysis reported	PAP-00446129-134
June 1993	8.0 mg/L	Not detected	Not detected	Not detected	PAP-00446115-128; PAP-00446274-77
July 1993	8.0 mg/L	Not detected	Not detected	Not detected	PAP-00446098-114
August 1993	7.8 mg/L	Not detected	0.02 mg/L	No analysis reported	PAP-00446046-48
September 1993	5.6 mg/L	0.10 mg/L	Not detected	No analysis reported	PAP-00446043-45
January 1994	11 mg/L	0.02 mg/L	0.01 mg/L	Not detected	PAP-00446027-6040
February 1994	18 mg/L	Not detected	Not detected	Not detected [Note: The semi-volatile analysis was performed with a 50x dilution resulting in raised detection limits (PAP-00446026).	PAP-00446009-6026; PAP-00446068-82
March 1994	8.4 mg/L	0.01 mg/L	0.02 mg/L	Not detected	PAP-00445994-6008; PAP-00446083-97
April 1994	18.0 mg/L	Not detected	0.02 mg/L	Not detected	PAP-00445978-93
May 1994	4.0 mg/L	Not detected	Not detected	Not detected	PAP-00445963-77

Note: Reported results which appear to exceed the permit limitations are highlighted grey.

A NJDEP letter to Goody Products dated September 27, 1989, discussing the results of an August 9, 1988, Compliance Evaluation Inspection stated that the Goody Products facility received an "Unacceptable" rating due to several deficiencies which included Discharge Monitoring Report violations for August 1988 through June 1989, the final effluent pipe at discharge 002 (sanitary wastewater) being inaccessible due to high weeds, and that a portion of the wastewater from the effluent pit for discharge 001 (industrial wastewater) discharges to ground and surface waters of the State. This deficiency had been cited in previous directive letters and it was stated again that Goody Products must apply for a Discharge to Groundwater Permit (PAP-00105282-84).

Numerous Industrial Process Wastewater Sludge Reports reported detections of copper, lead, and mercury (PAP-00446809; PAP-00447493-95; PAP-00447587, 762, 772, 786, 799, 960; PAP-00448032; PAP-00448065; PAP-00448076; PAP-00448115). Numerous other Industrial Process Wastewater Sludge Reports reported detections of just copper and lead (PAP-00446832; PAP-00446831; PAP-00446845; PAP-00447677, 678, 730, 744, 806, 814, 822; PAP-00448018; PAP-00448037; PAP-00448045; PAP-00448053; PAP-00448090, 97; PAP-00448105; PAP-00448139). These sludge wastes were disposed of as hazardous waste off-site (PAP-00447447-58).

A January 1993 NJDEP monitoring report stated that on December 11, 1992, both the sanitary and industrial wastewater treatment systems were out of service due to flooding in the area. Both systems were restored by December 21, 1992 (PAP-00105280-81).

Release

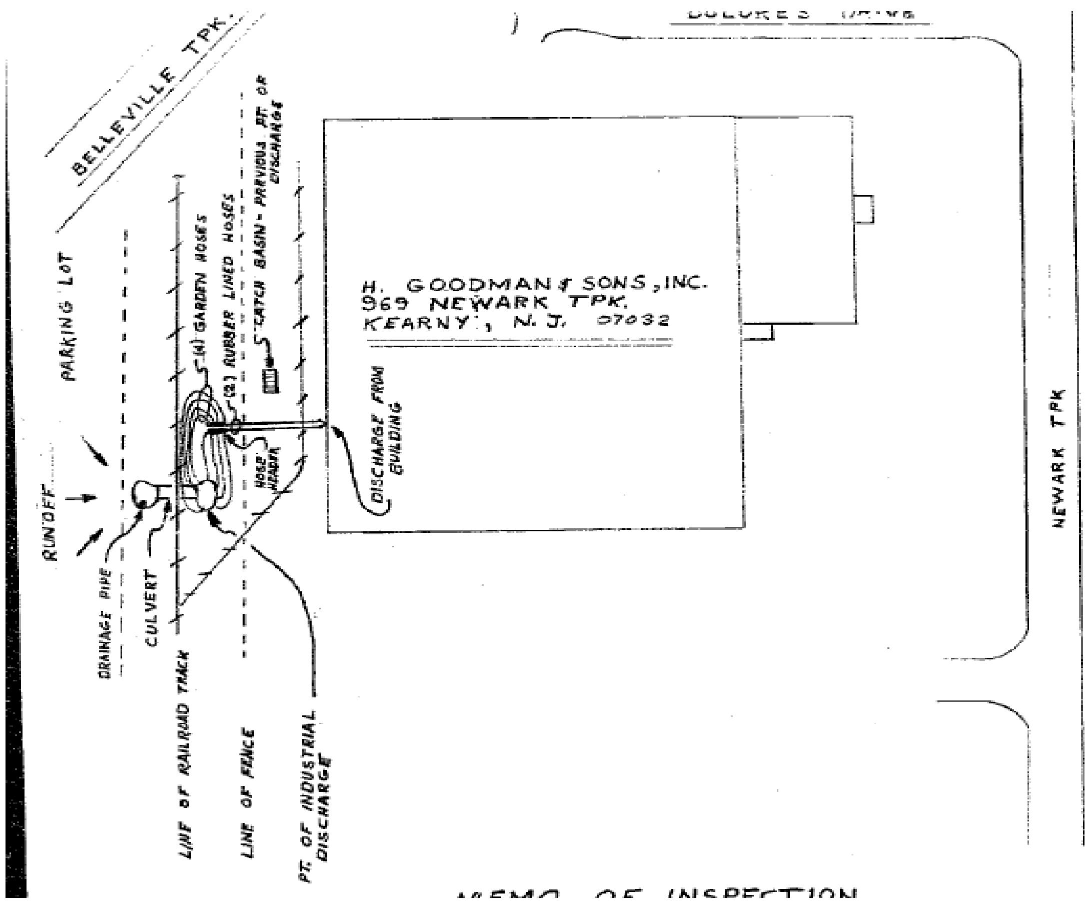
According to a NJDEP memorandum dated October 21, 1975, after a September 18 1975 inspection by the NJDEP it was noted that there were no provisions in place for containment or treatment of the industrial wastewaters at the point of discharge. Two discharge hoses were used for the conveyance of collected plating room floor drain wastewaters out of the plant. The untreated industrial wastewaters were being allowed to discharge onto plant grounds. According to a representative of H. Goodman & Sons, Inc., this had been the procedure followed by the facility for a number of years. It was noted that the hoses were evident in a 1974 inspection, but it was suggested at that time that the hoses were not in use (PAP-00105514).

An October 18, 1979, NJDEP Discharge Surveillance Report included a Plant Diagram and Flow Sequence for the Plating and Etching operation showing the batch tanks rinse waste would flow to floor drains, then to sump pit, then pumped to ground surface behind plant property (PAP-00351067).

A Plant Diagram and Flow Sequence included with a NJDEP Plant Inspection and Status Report Form dated August 23, 1983, shows the acid rinse sump, burnishing sump, and caustic rack strip sump all draining directly into Dead Horse Creek (PAP-00105320-22). The NJDEP Plant Inspection and Status Report Form dated August 23, 1983 states that the Goody facility was waiting for the industrial wastewater treatment system to be installed (PAP-00105320-21).

Starting in September 1984, the industrial waste effluent from the electroplating and burnishing operations were treated at the facility's industrial wastewater treatment plant and discharged to Dead Horse Creek at Outfall 001, located near the northwest corner of the Facility building. A concrete block tank (discharge pit) was constructed in the facility's west yard to act as a collection point so that the IWTP effluent could be pumped to Dead Horse Creek (PAP-00104321-22; PAP-00105318; PAP-00105373).

According to a NJDEP memorandum dated November 3, 1978, an investigation was conducted on October 6, 1978, by the NJDEP to verify the direction of the treated sewage treatment plant discharge from the H. Goodman & Sons, Inc. facility. According to the November 1978 memorandum (PAP-00105486) and a separate memo dated October 6, 1978 (PAP-00105489), NJDEP found that the discharge flowed through a 12" reinforced concrete pipe under the Newark Turnpike, through a wetland area, entering a 60" culvert which then emptied into a drainage ditch between the railroad line and the U.S. Post Office, through another 60" culvert flowing under the Post Office property, through a second wetland area, then flowing through an underground drainage canal along an abandoned transformer building, out of the drainage canal, flowing under the Erie Lackawanna Railroad track, then finally entering the tide pump well and being discharged to the waters of the Passaic River (PAP-00105486; PAP-00105489).



(PAP-00105491)

The NJDEP inspected the Facility in May 1971 and observed that the "ditch" (i.e. Dead Horse Creek) was blocked and the blockage caused the wastewater to back up and flood the Facility (PAP-00103321). Goody believed that the construction of the U.S. Post Office had blocked the flow of Dead Horse Creek causing wastewater to back up on the Facility property (PAP-00104747).Observations of dye testing at the Facility have shown that industrial wastewater discharges prior to 184 on the norther side of the building did not flow to Dead Horse Creek (PAP-00105515).

NJDEP Discharge Surveillance Reports dated August 27, 1987, and March 10, 1988, gave unsatisfactory ratings to several categories due to flooding and the lack of drainage and flow under Newark Turnpike (PAP-00105293-95).

NJDEP performed a dye study to verify the drainage of Dead Horse Creek in 1980. According to NJDEP, a dye tablet dropped at the mouth of the sewage treatment plant effluent discharge pipe remained in Dead Horse Creek on the facility side of Newark Turnpike and was not transported through the 12-inch RCP culvert under the Newark Turnpike (PAP-00105480). It was stated that there is only a flow when there is severe flooding on the Goody side of the road (PAP-00105480).

A March 24, 1988, evaluation of the system by Converse Environmental East for Goody Products found surface water drainage problems that may be caused by one or more of the following: an earth berm across the creek, a fully or partially blocked culvert under the Newark Turnpike adjacent to and south of the site, and a non-operating pump station at Dead Horse Creek's discharge into the Passaic River. The evaluation noted that the earthen berm across the creek "has been breached, to some degree." It was also noted the existing 12 to 15-inch culvert under the Newark Turnpike was scheduled to be replaced by a larger 24-inch culvert within the next two weeks from the report date. The pump was noted as being inoperable for about two months (PAP-00104611-12). There is no record of the culvert ever being replaced.

Converse Environmental East surveyed surface water elevations in Dead Horse Creek on March 23, 1989. Surface water elevation at the time of the survey was above normal stage due to precipitation that had occurred several days before the survey. The survey points were located near the culvert at the Newark Turnpike and near the Sanitary Treatment Plant in the northwest portion of the site. The surface water elevation at both locations was 2.49 feet. It was observed that the creek was ponding due to damming effects at the culvert orifice (PAP-00104344-45).

Culverts located under Newark Turnpike and the Passaic were frequently clogged resulting in elevated water levels in Cedar Marsh and flooding on surrounding properties (PAP-00104728-29).

The Pumping Station (also referred to as the Cedar Creek Pumping Station, the Hudson County Pumping Station or the HCMC Pumping Station, Tide Well) was funded and built by the NJ State Mosquito Control Commission between 1953 and before 1962 to provide drainage for the Cedar Creek Marsh. A major storm in 1962 caused severe damage of the mosquito control installations. The Pumping Station was having chronic problems since the 1960's and HCMC eventually stopped fixing it. As of at least 1991, the

Pumping Station was inoperable (PAP-00104661). A 1991 report also noted that water flowed from Cedar Marsh through a culvert (when it was not clogged) and then out to the Passaic River during low water levels in the Passaic River through a gravity outlet (Id.). No mention of the gravity outlet has been seen in other documents.

According to the May 1996 Remedial Investigation Report / Remedial Action Workplan for Goody Products, Inc., Dead Horse Creek analytical results from samples collected on March 22, 1996 from 0.0 – 0.5 feet from the base of the stream contained max concentrations of PAHs in sample 03226-78 including benzo(a)anthracene (4,800 mg/kg), Benzo(b)fluoranthene (6,200 mg/kg), Benzo(k)fluoranthene (2,400 mg/kg), Benzo(a)pyrene (4,600 mg/kg), indeno(1,2,3 cd)pyrene (3,000 mg/kg), copper (382 mg/kg), lead (780 mg/kg) and mercury (2.10 mg/kg) (PAP-00104964; 5040).

Sample ID	032296-76	032296-77	032296-78	032296-79	032296-80	032296-81	032296-82	032296-83	032296-84	032296-85	NJDEP Residential Direct Soil Cleanup Criteria	NJDEP Impact to Groundwater Soil Cleanup Criteria
Sample Depth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Laboratory ID Number	44260	44261	44262	44263	44264	44265	44266	44267	44268	44269		
PAH Compounds (mg/kg)												
Naphthalene	0.400	ND	ND	ND	0.550	ND	0.730	0.870	1.200	ND	230	100
Acenaphthylene	0.950	ND	ND	ND	0.170	0.310	0.250	ND	0.300	ND	NCC	NCC
Acenaphthene	1.500	2.600	3.500	1.200	0.990	1.000	1.200	1.800	1.400	1.600	3400	100
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2300	100
Phenanthrene	2.900	3.300	6.900	2.700	2.400	2.200	2.500	3.700	2.100	2.700	NCC	NCC
Anthracene	1.200	0.800	1.600	0.420	0.560	0.510	0.630	0.470	0.370	0.450	10000	100
Fluoranthene	9.300	5.200	12.000	3.000	2.400	2.100	2.400	2.300	1.700	3.100	2300	100
Pyrene	7.900	4.200	9.100	2.700	2.400	2.000	2.400	2.300	1.600	3.100	1700	100
Benzo(a)anthracene	4.100	1.600	4.800	1.100	0.780	0.570	0.680	0.780	0.700	1.200	0.9	500
Chrysene	4.500	1.900	4.700	1.500	0.900	0.870	0.920	0.830	0.480	1.300	9	500
Benzo(b)fluoranthene	5.300	2.300	6.200	1.500	1.300	0.920	1.200	0.790	0.710	1.100	0.9	50
Benzo(k)fluoranthene	2.000	ND	2.400	ND	ND	ND	ND	ND	ND	ND	0.9	500
Benzo(a)pyrene	3.600	1.900	4.600	1.400	0.700	0.590	0.770	0.520	0.630	0.710	0.66	100
Indeno(1,2,3 cd)pyrene	2.700	1.300	3.000	0.760	0.620	0.630	0.750	0.470	0.450	0.730	0.9	500
Dibenz(a,h)anthracene	0.550	ND	ND	ND	ND	0.230	0.220	ND	ND	ND	0.66	100
Benzo(g,h,i)perylene	2.400	1.300	3.100	0.900	0.720	0.670	0.700	0.460	0.500	0.640	NCC	NCC
Total PAH	49.300	26.400	61.900	17.200	14.490	12.600	15.350	15.290	12.140	16.630	NCC	NCC
PP Metals (mg/kg)												
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	NCC
Arsenic	12.2	10.1	12.1	10.6	12.4	10.3	11.6	11.6	15.5	9.2	20	NCC
Beryllium	0.59	0.51	0.55	0.38	0.34	0.26	0.36	0.41	0.27	0.39	1	NCC
Cadmium	42.0	314.0	275.0	502.00	394.0	450.0	378.00	529.0	364.00	823.00	1	NCC
Chromium	1910.0	1280.0	1930.0	1140.0	1750.0	1900.0	2120.0	2040.0	1820.0	1290.0	500	NCC
Copper	285.0	318.0	382.0	281.0	250.0	258.0	227.0	321.0	244.0	510.0	600	NCC
Lead	996.0	396.0	780.0	408.0	448.0	312.0	304.0	606.0	264.0	563.0	600	NCC
Mercury	1.60	0.82	2.10	1.30	1.60	1.40	0.98	1.20	0.81	1.60	14	NCC

(PAP-00105040)

6. Regulatory History/Enforcement Actions

Violations and Enforcement Actions

In November 1975, the NJDEP issued an order to H. Goodman & Sons, Inc. to cease the discharge of all polluting materials (PAP-00105499; PAP-00105516-17).

In a letter received on December 1, 1975, the NJDEP issued a Notice of Violation and Offer of Settlement to H. Goodman & Sons, Inc. for the discharges of industrial waste allowing the flow of polluting materials into the waters of Dead Horse Creek, a tributary to the Passaic River. The discharges were noted in inspections conducted on June 5, 1975, June 12, 1975, and September 18, 1975 by NJDEP and included excessive heavy metal parameters (PAP-00105499; PAP-00105518-19). Note: The specific metals which exceeded permit levels were not specified.

On July 17, 1978, the U.S. EPA issued a Findings of Violation and Order to Show Cause to H. Goodman & Sons, Inc., for violating the Clean Water Act by discharging pollutants without a National Pollutant Discharge Elimination System (NPDES) permit (PAP-00103534-43). Note: The specific pollutants which exceeded permit levels were not specified.

A NJDEP Discharge Surveillance Report for an inspection conducted on June 5, 1979 noted a major deficiency as 6,000 gallons per day of an unspecified liquid were discharging into Dead Horse Creek. The majority of the evaluation parameters were noted to be “flooded.” This included the grounds and buildings, the settling units, aeration (contact), effluent (residual), contact tank, and final effluent appearance (PAP-00105481-83). Note: The Surveillance Report did not specify which outfall discharged the 6,000 gallons.

According to a NJDEP letter to Goody Products dated September 26, 1983, the Goody Products facility earned an “acceptable” rating after a Compliance Monitoring Inspection conducted on September 15, 1983 (PAP-00105425).

According to a December 13, 1985, NJDEP Discharge Surveillance Report, two discharges observed exceeded permit limitations for pH, cyanide, nickel and total suspended solids (PAP-00105297).

According to November 24, 1987, correspondence, a Compliance Evaluation Inspection was conducted by NJDEP on August 27, 1987, and September 8, 1987. The Goody Products facility received a rating of “Unacceptable” due to several deficiencies. These deficiencies included that the bypass of the effluent filter and filter press at Industrial Treatment, discharge 001, due to pump failure had not been reported as required by NJPDES Permit No. NJ0029505, and the final effluent contained visible solids (PAP-00447020-21). Deficiencies at the Sewage Treatment, discharge 002, included the fact that the sanitary wastewater treatment plant was flooded, so that representative effluent samples could not be obtained; and the primary settling units, contact aeration tanks, secondary settling units, sludge holding, and chlorine contact tanks were flooded in violation of N.J.A.C. 7:9-1.39(a) (PAP-00447021). Soil samples taken from the surface of the ground surrounding the industrial waste discharge pit were taken on September 8, 1987. Exceedances included lead at 210 ppm (PAP-00447021-22, 27). Copper was detected at 82 ppm (PAP-00447027). Goody Products responded to the NJDEP on January 18, 1988 (PAP-00447047-51).

A NJDEP letter to Goody Products dated September 27, 1989, discussing the results of an August 9, 1988, Compliance Evaluation Inspection stated that a Notice of Violation was issued for Discharge Monitoring Report violations for August 1988 through June 1989. These violations included copper on three occasions. Another deficiency listed was that a portion of the wastewater from the effluent pit for DSN 001 discharges to ground and surface waters of the State. It was stated that Goody Products must apply for a Discharge to Groundwater Permit. Goody Products was required to submit a written report concerning specific details of remedial measures to be instituted, as well as an implementation timetable within 30 days (PAP-00105282-84; PAP-00447388-91). According to the November 22, 1989, Administrative Order and a Notice of Civil Administrative Penalty Assessment issued by NJDEP to Goody Products, in September 1988 and June 1989 copper was detected at Outfall 001 at 0.30 mg/L and 0.24 mg/L, respectively (PAP-00350677-88).

A Compliance Evaluation Inspection was conducted on September 19, 1991, by NJDEP. The Goody Products facility received a rating of "Unacceptable" because a review of the Discharge Monitoring Reports revealed that permit effluent limitations were exceeded at discharges 001 and 002. These violations included a February 1991 discharge of copper 0.15 mg/L (PAP-00447037-38).

A September 29, 1993, Administrative Consent Order Affidavit included a Summary of Enforcement Actions for Violation of Environmental Laws or Regulations which discussed 11 violations which occurred from December 1975 through August 1993. Violations included effluent limitation exceedances, alleged discharges to ground surface, and unpermitted discharges (PAP-00350695-98). Note: The pollutants which exceeded effluent limitations were not specified in the source document.

According to the May 1994 *Report of Environmental Record Check and Review*, on November 22, 1989, the NJDEPE issued an Administrative Order and a Notice of Civil Administrative Penalty Assessment to Goody Products. The penalty was for violations which occurred in 1988, 1989, and 1990. The parameters for which the permit limits were violated included copper amongst others. In September 1988 and June 1989 copper was detected at Outfall 001 at 0.30 mg/L and 0.24 mg/L, respectively. NJDEP determined that a penalty of $859,500 should be assessed (PAP-00350677-88). The penalty was settled on May 28, 1991 for $1.1 million (PAP-00402685-88). In addition, S&S Environmental Sciences, Inc. noted that based on information supplied by Goody Products on its ISRA Site Evaluation Submission, other NJPDES effluent violations occurred after 1990 and as late as August 25, 1993 (PAP-00103482-83).

In 1996, a Remedial Action Work Plan dated May 1996 was submitted to NJDEP for approval as part of the November 1993 Remediation Agreement. NJDEP stated in a letter to Newell that further delineation of the groundwater was needed, but the soil remediation plan could be conditionally approved as a Partial Remedial Action Work Plan. The approved cleanup plan was to remove the soil hot spots, collect post-excavation samples and place capping on the property (PAS-00002044). The four areas of concern (AOC) were the wastewater discharge pit and the area south of the wastewater discharge pit (AOC 1) which contained lead above 600 ppm; the west yard which includes the hazardous waste storage area, central west yard, and former waste

discharge pipe (AOC 2) which included copper and lead as contaminants of concern; the north yard which includes the heating system condensate slowdown pipe discharge area, the burnishing room pipes/hoses discharge area, and compressor blowdown pipe discharge area (AOC 3); and Dead Horse Creek (AOC 4). It was noted that the vertical delineation of the metal contamination in several areas had to be completed (PAS-00002044-46). The PAH levels in soil samples associated with the former UST location were above the impact to groundwater criteria; however, it was noted that there were no monitoring wells installed in this area. Therefore, it was requested that Goody Products submit a proposal to investigate the impact of the PAH contamination on the groundwater (PAS-00002048).

Permits

Goody Products operated under NJPDES discharge permit No. NJ0029505, which granted the company permission to discharge to Dead Horse Creek. The permit was issued June 2, 1984 and effective August 1, 1984 and had an expiration date of July 31, 1989 (PAP-00350677; PAP-00447426; PAS-00001878). Contaminants to be monitored under this permit included lead and copper which daily discharges were not to exceed 0.1 mg/L and oil and grease which daily discharge was not to exceed 20 mg/L (PAP-00446410; PAP-00447439; PAS-00001891). Note: PAHs may be present in oils.

According to the 1983 Public Notice for the issuance of draft NJPDES permit No. NJ0029505, there were two existing surface water discharge outfalls at the Goody Products facility. Discharge 001 was industrial process wastewater generated from various metal finishing operations that would receive treatment consisting of equalization, neutralization, flocculation, clarification, and filtration. Discharge 002 was sanitary wastewater which received treatment consisting of primary settling, aeration, secondary settling, and chlorination (PAP-00105420; PAP-0010540-41).

7. Response Actions

The following characterization activities have taken place at the facility:

- October 1994 Preliminary Remedial Investigation Workplan (PAP-00105052)
- August 1995 Industrial Site Recovery Act Site Investigation Report/Revised Remedial Investigation Workplan Addendum (PAP-00446881)
- May 1996 *Remedial Investigation Report/Remedial Action Workplan and Groundwater Evaluation Report* (PAP-00104898)
- October 1997 Industrial Site Recovery Act Remedial Action Report (PAP-00425794)

According to the June 1993 *Results of Field Investigation and Review of Remedial Options*, an environmental site investigation was conducted at the Goody Products facility by Converse Environmental East in May, June, and September, 1988 in response to a letter from the NJDEPE dated November 24, 1987. Phase I included soil sampling conducted by Converse Environmental East from 54 test pits excavated mainly in the western portion of the site to characterize the extent of contamination. Phase II, which was conducted in September 1988, included additional soil sampling to further delineate

the horizontal and vertical extent of contamination identified in Phase I as well as the installation and sampling of seven overburden monitoring wells, finished below the peat layer (PAP-00104155; PAS-00001964).

The Phase I soil sample results which exceeded the NJDEPE Proposed Cleanup Standards Residential Surface Soil for copper (600 milligram/kilogram [mg/kg]) and lead (100 mg/kg) ranged as follows:

- Copper: 757.1 mg/kg in sample TP-27, collected at a depth of 0 to 0.5 feet on June 3, 1988 to 1,121 mg/kg in sample TP-31, collected at a depth of 0 to 0.5 feet on June 3, 1988 (PAP-00104185-88; PAS-00001966-69)

- Lead: 101.3 mg/kg in sample TP-44 collected at a depth of 0 to 0.5 feet on June 6, 1988 to 13,572 mg/kg in sample TP-48, collected at a depth of 0 to 0.5 feet on June 8, 1988 (PAP-00104185-88; PAS-00001966-69)

The Phase II soil sample results which exceeded the NJDEPE Proposed Cleanup Standards Residential Surface Soil for lead (100 mg/kg) ranged as follows:

- Lead: 100.8 mg/kg in sample TP-71D collected at a depth of 4 to 4.5 feet on September 30, 1988 to 3,459 mg/kg in sample SB-5D collected at a depth of 3 to 3.5 feet on September 22, 1988 (PAP-00104189-91; PAS-00001970-72)

The specific locations of the samples discussed above could not be determined from the available references as the sample location map was not legible.

According to the June 1993 *Results of Field Investigation and Review of Remedial Options*, the highest levels of metals occurred in samples collected near the waste water treatment plant (WWTP) Discharge Pit, the yard area northwest of the hazardous waste storage area, and adjacent to the north side of the building (PAS-00001965). The concentrations of lead and copper exceeded both residential and non-residential cleanup standards. See Phase I and Phase II results above for the specific concentrations. No contaminants of concern were detected in any of the groundwater samples collected in 1988 (PAS-00001981-82).

According to the June 1993 *Results of Field Investigation and Review of Remedial Options*, a preliminary round of groundwater sampling in the seven existing wells was started on October 26 and October 27, 1992, to confirm the previous groundwater sampling results (PAS-00001984). In general, the total metals concentrations were above the previous results (PAS-00001992). One groundwater monitoring well (MW-7) contained lead (145 µg/L) above the proposed standard of 10 µg/L (PAS-00001994).

Five shallow piezometers were also sampled for metals to evaluate the effects of the metal contamination in the fill on the shallow groundwater (PAS-00001984-86). Lead was above the NJDEPE proposed cleanup standard (10 µg/L) in the five samples with concentrations ranging from 49 µg/L in PZ-3 to 2,030 µg/L in PZ-5S. Mercury was detected above the 2 µg/L standard in four samples with concentrations of 116 µg/L in PZ-1, 7.9 µg/L in PZ-2, 66.4 µg/L in PZ-4S, and 3.2 µg/L in PZ-5S (PAS-00001995-96).

It was noted by Woodward-Clyde Consultants in the June 1993 *Results of Field Investigation and Review of Remedial Options* that the metal contamination detected in the piezometer samples may be the result of the high turbidity of the samples. Woodward-Clyde Consultants recommended that monitoring wells be installed and both filtered and unfiltered groundwater samples should be sampled after the wells have been properly developed (PAS-00001997). Note that the available references did not provide conclusive information regarding groundwater flow patterns at the site or specific information regarding the potential connection of groundwater to the Dead Horse Creek or to other potential pathways connected to the Passaic River.

On November 9 and 10, 1992, 16 test pits were excavated and sampled. Each test pit was excavated to the groundwater table, or refusal, with the depths ranging from 1.67 to 4.5 feet. Soil samples were collected from the six-inch interval which appeared to be most contaminated (PAS-00001989). The specific locations of the samples discussed above are shown on a Site Map included with the report (PAS-00001959). Six PAHs exceeded the proposed cleanup standards in multiple samples. These PAHs were also detected in several other samples at levels below the cleanup standards.

The PAHs detected included benzo(a)anthracene (concentrations ranging from 201 J µg/kg to 7,206 µg/kg in 14 samples), chrysene (concentrations ranging from 256 J µg/kg to 5,421 µg/kg in 14 samples), benzo(k)fluoranthene (concentrations ranging from 51 J µg/kg to 4,655 µg/kg in 15 samples), benzo(a)pyrene (concentrations ranging from 82 J µg/kg to 6,861 µg/kg in 14 samples), indeno(1,2,3-cd)pyrene (concentrations ranging from 111 J µg/kg to 2,350 µg/kg in six samples), and benzo(g,h,i)perylene (concentrations ranging from 222 J µg/kg to 2,098 µg/kg in nine samples). In addition, dibenzo(a,h)anthracene was detected below cleanup standards in three samples at concentrations ranging from 308 J µg/kg to 610 µg/kg. The sample locations with the highest concentrations were located in the western portion of the site. As for metals, two samples (GKW-4 and GKW-5 located in the northwest corner of the site) had lead concentrations at 6.98 parts per million (ppm) and 7.25 ppm which exceeded the toxicity characteristic leaching procedure (TCLP) regulatory limit of 5 ppm (PAS-00001959, 2009, 2012, 2016).

Creek bed sediment samples were collected on November 16, 1992, at three locations in Dead Horse Creek to evaluate potential contamination to the creek. The sample locations were at the south end of Dead Horse Creek (SED1), the middle (SED2, and the north end (SED3) near the Goody Sewer Treatment Plant (PAS-00001959). The samples were collected at depths ranging from 0.5 feet to 3 feet (PAS-00001959, 1991, 2025). Woodward-Clyde Consultants reported that no PAHs exceeded the proposed NJDEPE subsurface soil cleanup standards (PAS-00002024). However, according to the sampling results, chrysene in one sediment sample (SED2) had an estimated concentration of 675 J µg/kg, exceeding the proposed cleanup standard of 660 µg/kg (PAS-00002025). Additional PAHs detected in the SED2 sediment sample included acenaphthene (338 J µg/kg), phenanthrene (981 J µg/kg), fluoranthene (552 J µg/kg), pyrene (1,342 µg/kg), benzo(a)anthracene (634 J µg/kg), benzo(b)fluoranthene (585 J µg/kg), benzo(k)fluoranthene (579 J µg/kg), and benzo(a)pyrene (487 J µg/kg). The sediment sample SED1 also had the following PAHs detected below cleanup standards: acenaphthene (52 J µg/kg), phenanthrene (102 J µg/kg), fluoranthene (166 J µg/kg),

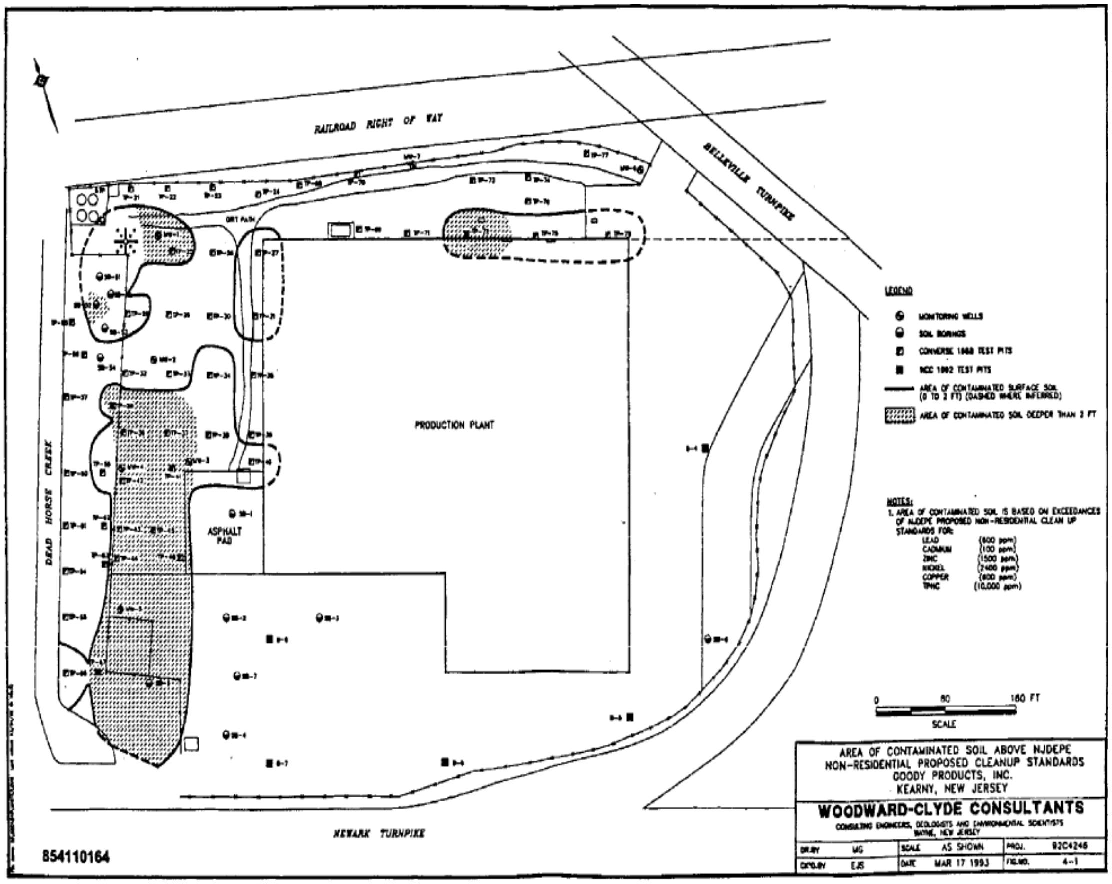
pyrene (286 J µg/kg). Likewise, the SED3 sediment sample had the following PAHs detected below cleanup standards: naphthalene (547 J µg/kg), anthracene (540 J µg/kg) and pyrene (496 J µg/kg) (PAS-00002025).

Subsurface soil samples were also collected from eight borings in the peat layer located throughout the site to determine whether the peat had absorbed contamination from the overlying soil and/or groundwater (PAS-00001990). These samples were analyzed for volatile organics and base neutral compounds. The results of the peat samples were consistent with the overlying fill according to Woodward-Clyde Consultants. Contaminants of concern were below NJDEPE proposed subsurface soil cleanup standards with the exception of naphthalene. The concentration of naphthalene (198 ppm) in one sample PEAT-3 collected from boring MP-2 at a depth of 12 to 14 feet below ground surface near the northwest corner of the plant building exceeded the NJDEPE 100 ppm standard. The PAHs detected include chrysene (PEAT-2, PEAT-3, and PEAT-4) in concentrations up to 1,176 parts per billion (ppb), benzo(a)pyrene (PEAT-2, PEAT-3, and PEAT-4) up to 1,170 ppb, and benzo(k)fluoroanthene (PEAT-3 AND PEAT-4) up to 22,229 ppb (PAS-00002018, 21). Note: Many of the reported results were flagged “J” indicating the result was detected below the method detection limit and is considered an estimated value.

Background samples were also collected in 1992 at locations along the eastern and southern portions of the site. These samples also had detections of PAHs (four of five samples) and metals (five of five samples) both above and below cleanup standards. The concentrations ranged as follows: 2-methylnaphthalene (40 J µg/kg), acenaphthylene (71 J µg/kg to 118 J µg/kg), acenaphthene (43 J µg/kg to 390 J µg/kg), fluorene (41 J µg/kg to 405 µg/kg), phenanthrene (443 µg/kg to 3,574 µg/kg), anthracene (121 J µg/kg to 1,065 µg/kg), fluoranthene (734 µg/kg to 5,285 µg/kg), pyrene (573 µg/kg to 4,630 µg/kg), benzo(a)anthracene (293 J µg/kg to 2,782 µg/kg), chrysene (319 J µg/kg to 2,596 µg/kg), benzo(b)fluoranthene (480 µg/kg to 2,948 µg/kg), benzo(k)fluoranthene (660 µg/kg to 2,060 µg/kg), benzo(a)pyrene (329 J µg/kg to 2,672 µg/kg), indeno(1,2,3-cd)pyrene (198 J µg/kg to 211 J µg/kg), dibenzo(a,h)anthracene (93 J µg/kg to 467 µg/kg), benzo(g,h,i)perylene (110 J µg/kg to 788 µg/kg), copper (39.6 mg/kg to 101mg/kg), lead (48.3 mg/kg to 377 mg/kg), and mercury (0.28 mg/kg to 3.7 mg/kg) (PAS-00001959, 2022-23).

Regarding the 1992 field investigation, Woodward-Clyde Consultants concluded in the June 1993 *Results of Field Investigation and Review of Remedial Options* that there did not appear to be any migration of contamination from soil to groundwater at the site. According to Woodward-Clyde Consultants, the shallow groundwater quality seemed consistent with soil contaminants found in the man-placed fill (PAS-00002028).

The following map from the *Results of Field Investigation and Review of Remedial Options* delineates the areas of contaminated soil above the NJDEPE non-residential proposed cleanup standards:



(PAS-00002026)

According to a May 1996 *Remedial Investigation Report/Remedial Action Workplan and Groundwater Evaluation Report* prepared by Killam Associates for Newell Company remedial investigation activities were implemented at the facility in November 1995 through March 1996 inside the manufacturing building and in exterior areas to delineate the vertical and horizontal extent of PAHs and certain priority pollutant metals (PAP-00104917).

According to the August 1995 Industrial Site Recovery Act Site Investigation Report/Revised Remedial Investigation Workplan Addendum for the Goody Products, Inc. Site, Goody initiated compliance with the ISRA due to its acquisition by Newell Company by providing the NJDEP with a Remediation Agreement in November of 1993. A Proposed Cleanup Plan was submitted along with the Remediation Agreement. The Cleanup Plan included an overview of previous environmental investigations and costs associated with potential site capping activities. Goody submitted a General Information Submission in December of 1993 and a Site Evaluation Submission (SES) in January of 1994. A report entitled Results of Field Investigation dated October 1993 was provided under separate cover along with the SES. Representatives of the NJDEP conducted a site inspection on March 30, 1994 and issued a Report of Inspection on April 20, 1994. The Report of Inspection noted a number of deficiencies and identified actions required on the part of the responsible party (PAP-00446887).

The purpose of the Site Investigation Report/Revised Remedial Investigation Workplan was to summarize the site investigation activities performed in June-August of 1995 and to set forth remedial investigation activities for those areas of concern identified through implementation of the site investigation activities (PAP-00446890). One area of concern was an underground storage tank (UST) that was formerly located at the northern portion of the Goody site, adjacent to the north wall of the building. The tank had a capacity of 10,000 gallons and was reported to have contained No. 4 fuel oil. Following the removal of the UST, confirmation samples were collected and five PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene) were detected above corresponding NJDEP Cleanup Criteria in the deeper sample obtained from the southern sidewall. These results were initially attributable to historical urban fill materials placed at the site in conjunction with site development. As such, no further action was proposed with regard to the former UST. The NJDEP reviewed the May 1990 UST report included in the July 1994 Preliminary RIW and issued comments regarding same. The NJDEP required that Goody collect additional soil samples to identify the presence/absence of contaminants at the north side of the former excavation area and at the former fill pipe area as well as to delineate the presence of base-neutral compounds detected in the confirmation sample collected from the south side of the former excavation (PAP-00446891-92).

Analytical results from this additional sampling revealed the presence of seven PAH compounds above respective NJDEP Cleanup Criteria in sample UST-W1. Benzo(a)anthracene was detected at 19 ppm, chrysene at 19 ppm, benzo(b)fluoranthene at 20 ppm, benzo(k)fluoranthene at 8.4 ppm, benzo(a)pyrene at 16 ppm, indeno(1,2,3-cd)pyrene at 12 ppm and dibenz(a,h)anthracene at 2.7 ppm. In addition, samples were collected from two test pits installed west and east of a previous sample which had PAH detections in excess of NJDEP Cleanup Criteria. Benzo(a)pyrene was detected at 0.73 ppm and indeno(1,2,3-cd)pyrene at 1.4 ppm. The report concluded that based on analytical results from the April 1995 sampling round, additional sampling was warranted to delineate the presence of PAH compounds detected in these samples (PAP-00446895).

According to the August 1995 Industrial Site Recovery Act Site Investigation Report/Revised Remedial Investigation Workplan Addendum the March 1995 SI/RIW Addendum identified four areas of potential environmental concern at the site. The four areas of potential environmental concern identified were as follows: interior process areas, pipe discharge areas, the sanitary treatment plant, and two stained areas adjacent to air conditioner units. The identification of these areas necessitated the performance of site investigation activities and a sampling program to identify the presence/ absence of contaminants. In addition, review of previous environmental investigations stated that two previously identified areas of environmental concern (i.e., sediment at Dead Horse Creek and sample locations for which the minimum detection limit was noted to exceed the current NJDEP Cleanup Criteria) required acquisition of samples to identify current conditions (PAP-00446898).

Sample results at areas of environmental concern which included COCs of the OU2 Project site included the portion of the North Yard located between the two former openings in the northern exterior wall of the Burnishing Room and the northern fence line. In general, analytical results at this location revealed varying concentrations of PAH compounds and priority pollutant metals in all samples. Copper was detected at 962 ppm and 2,550 ppm; lead at 861 ppm and 2,320 ppm; benzo(a)anthracene at 1.7 ppm, 1.8 ppm, and 1.9 ppm; benzo(b)fluoranthene at 1.4 ppm, 2.7 ppm, 3.1 ppm, and 3.4 ppm; benzo(k)fluoranthene at 1.0 ppm, 1.1 ppm, and 1.2 ppm; and benzo(a)pyrene at 0.95, 1.5 ppm, 1.9 ppm and 1.9 ppm (PAP-00446905-06). Another area of environmental concern which included COCs of the OU2 Project site were the Heating System - Blowdown/Condensate pipes. Samples collected in this area had detections which included benzo(b)fluoranthene at 0.93 ppm and 1.1 ppm, benzo(a)pyrene at 0.76 ppm, and copper at 1,290 ppm (PAP-00446909-10).

Three sediment samples were collected June 30, 1995, from the eastern bank of Dead Horse Creek. One sample was obtained upstream of industrial and sanitary system discharge points (STR-15), one sample was obtained near the southern limit of the stream (STR-17) and the remaining sample was obtained at a representative mid-point area (STR-16). The sample locations were biased toward natural accumulation points along Dead Horse Creek. The former industrial wastewater discharge pipe was not located; therefore, no sample was obtained from the discharge point (PAP-00446914).

PAH compounds and lead were detected in the three sediment samples. Sample STR-15 had detections of benzo(a)anthracene at 2.8 ppm, benzo(b)fluoranthene at 3.8 ppm, benzo(k)fluoranthene at 1.4 ppm, benzo(a)pyrene at 2.7 ppm, indeno(1,2,3-cd)pyrene at 0.97 ppm, and lead at 228 ppm. Sample STR-16 had detections of benzo(a)anthracene at 1.4 ppm, benzo(b)fluoranthene at 2.3 ppm, benzo(a)pyrene at 1.6 ppm, and lead at 169 ppm. Sample STR-17 had detections of benzo(a)anthracene at 1.2 ppm, benzo(b)fluoranthene at 2.7 ppm, benzo(k)fluoranthene at 0.94 ppm, benzo(a)pyrene at 1.3 ppm, and lead at 547 ppm (PAP-00446915-16).

Since historical information states that fill material was placed at the site in conjunction with site development activities, it was proposed to evaluate conditions at non-process areas of the site to determine the presence/ absence of fill at these areas and to ascertain the environmental quality of same. Based on historical information and observations rendered during site reconnaissance, no process operations and/or storage has been conducted at the eastern portion of the site, east of the loading dock area. As such, it was proposed to install nine soil borings and collect one sample from the fill layer and one sample from the peat layer at this area to establish background conditions. The NJDEP approved the proposed actions in its June 1995 response letter (PAP-00446918).

A variety of fill materials including brick fragments, metal pieces, asphalt pieces, wood pieces was noted with regard to the fill layer during soil boring installation activities. Six of the nine samples collected from the fill material exhibited concentrations of PAHs in excess of NJDEP Cleanup Criteria (BG-2, BG-4A, BG-5, BG-7A, BG-8A and BG-9). Sample BG-2 contained benzo(b)fluoranthene at 1.1 ppm and benzo(a)pyrene at 0.84 ppm. Five PAHs were detected in each of samples BG-4A, BG-5, and BG-7A:

benzo(a)anthracene at 3 ppm, 4.3 ppm and 2.8 ppm respectively; benzo(b)fluoranthene at 3.4 ppm, 4.5 ppm, 3.4 ppm respectively; benzo(k)fluoranthene at 1.2 ppm, 1.8 ppm, and 1.4 ppm respectively; benzo(a)pyrene at 2. 7 ppm, 3.4 ppm, and 2.6 ppm respectively; and indeno(1,2,3-cd)pyrene at 1.3 ppm, 1.7 ppm and 1.3 ppm respectively. Samples BG-SA and BG-9 each contained three PAHs: benzo(a)anthracene at 1.2 ppm and 1.3 ppm respectively; benzo(b)fluoranthene at 1.5 ppm in both samples; and benzo(a)pyrene at 1.2 ppm and 1.1 ppm respectively. In addition, one of the three samples collected from the peat layer also exhibited PAHs in excess of NJDEP Cleanup Criteria. Sample BG-8B contained benzo(a)anthracene at 4.6 ppm, benzo(b)fluoranthene at 4.8 ppm, benzo(k)fluoranthene at 1.9 ppm, benzo(a)pyrene at 4 ppm and indeno(1,2,3-cd)pyrene at 2.3 ppm (PAP-00446919-20).

None of the samples from the fill layer exhibited concentrations of metals in excess of NJDEP Cleanup Criteria. However, numerous metals were detected, in varying concentrations, in these samples. [Note: The source document does not provide these concentrations.] Mercury was detected in one of the samples collected from the peat layer in excess of NJDEP Cleanup Criteria. Sample BG-8B contained mercury at 23.8 ppm (PAP-00446920).

The report determined that based on analytical results, one or more PAHs exist at concentrations in excess of corresponding NJDEP Cleanup Criteria in the samples collected from the fill layer at the non-process area of the site. Furthermore, it appears that PAHs and certain priority pollutant metals are also present in a sample from the peat layer at the non-process area of the site. As the contaminants detected in these samples were not the result of process operations, no remedial investigation activities were proposed at this time for these locations (PAP-00446920).

Based on the results of the site investigation activities, additional actions were determined to be warranted to delineate the presence of contaminants detected at elevated concentrations in samples collected during site investigation activities. Remedial investigation activities for the site were proposed (PAP-00446922-38).

Analytical results from samples collected in March 1996 reveal the presence of one or more PAH compounds above corresponding NJDEP Cleanup Criteria in eight of the 10 Dead Horse Creek sediment samples. Specifically, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene were detected in excess of NJDEP Cleanup Criteria in two or more samples. Lead was detected in all samples but was in excess of its NJDEP Cleanup Criteria of 600 ppm in three samples with a maximum concentration of 996 ppm. Copper was detected in all samples with a maximum concentration of 510 ppm and mercury was detected in all samples with a maximum concentration of 2.10 ppm. The remaining priority pollutant metals were either not detected or were detected in concentrations below corresponding NJDEP Cleanup Criteria The maximum concentrations detected for the PAHs were as follows: acenaphthene (3.5 ppm), acenaphthylene (0.95 ppm), anthracene (1.6 ppm), naphthalene (1.2 ppm), phenanthrene (6.9 ppm), benzo(a)anthracene (4.1 ppm), benzo(a)pyrene (4.6 ppm), benzo(b)fluoranthene (6.2 ppm), benzo(g,h,i)perylene (3.1 ppm), benzo(k)fluoranthene (2.4 ppm), chrysene (4.7 ppm), dibenzo(a,h)anthracene (0.55 ppm), fluoranthene (12 ppm), indeno(1,2,3-

cd)pyrene (3.0 ppm), and pyrene (9.1 ppm) (PAP-00104964-65, 5040). Note: The locations of these samples within the Dead Horse Creek streambed were not provided in the source document.

A remedial strategy for soil and sediment was approved by NJDEP in a letter dated September 4, 1996, which included “hot spot” excavation, sediment removal, placement of an environmental cap, and imposition of a site-wide Declaration of Environmental Restriction. The “hot spot” excavation for soil was performed from September 1996 through September 1997 (PAP-00104770).

According to the October 1997 Industrial Site Recovery Act Remedial Action Report, Soil, investigative efforts performed in conjunction with, and prior to, this ISRA compliance effort revealed the presence of historic fill throughout the subject site including areas beneath the site building. The primary contaminants which have been identified in the historic fill material at this site include heavy metals and PAHs. The investigative efforts also identified areas of environmental concern (AECs) at the site unrelated to the historic fill material. Analytical results from samples collected at some of these identified the presence of contaminants in soil unlikely to be related to historic fill. Therefore, further evaluation of these areas was performed to delineate contaminants unrelated to historic fill. Analytical results from samples collected at the remaining AECs revealed the presence of contaminants which could be attributed to either the historic fill material or process operations. In addition, analytical results from a few areas revealed contaminants related to fill material and did not reveal the presence of contaminants related to process operations. The report states that therefore, investigative efforts confirmed that contaminants at concentrations in excess of NJDEP Cleanup Criteria were related to historic fill material (PAP-00425805).

Investigative efforts also identified the presence of a limited number of contaminants (i.e., certain priority pollutant metals and PAH compounds) in samples from the stream sediments. Based on information gained through soil sampling efforts, the presence of contaminants in stream sediments is attributable to fill material and overland storm water flow and, to some degree, contaminants may be attributable to process operations (PAP-00425805). However, a site survey determined that the western portion of Dead Horse Creek is situated beyond the property limits of the Goody site. Therefore, the remedial activities for sediments in Dead Horse Creek would commence upon execution of an access agreement with the adjacent property owner (PAP-00425807).

To verify the success of the remedial efforts (i.e. “hot spot” excavation), confirmation samples were collected from the majority of the site AECs. However, confirmation samples were not collected in those instances where excavations were advanced to “clean” samples (PAP-00425845).

A summary of analytical results for the Burnishing Room Pipes/Hoses Discharge Area listed the following concentrations:

Remedial Action Report Samples		
COC	**Concentration Ranges**	**Depth of Max**
Benzo(a)anthracene	0.350 mg/kg – 6.000 mg/kg	3.0-3.5 ft.
Benzo(a)pyrene	0.340 mg/kg – 4.800 mg/kg	3.0-3.5 ft.
Benzo(b)fluoranthene	0.470 mg/kg – 6.700 mg/kg	3.0-3.5 ft.
Benzo(g,h,i)perylene	0.270 mg/kg – 1.800 mg/kg	3.0-3.5 ft.
Benzo(k)fluoranthene	0.200 mg/kg – 2.600 mg/kg	3.0-3.5 ft.
Dibenzo(a,h)anthracene	0.068 mg/kg – 0.630 mg/kg	3.0-3.5 ft.
Indeno(1,2,3-cd)pyrene	0.240 mg/kg – 2.200 mg/kg	3.0-3.5 ft.
Copper	27.6 mg/kg – 213 mg/kg	3.0-3.5 ft.
Lead	37 mg/kg – 352 mg/kg	3.0-3.5 ft.
Mercury	0.08 mg/kg – 6.3 mg/kg	0.0-0.5 ft.

(PAP-00425856-57)

A summary of analytical results for the KTP-1/TP-27 Area listed concentrations of copper ranging from 32.6 mg/kg to 331 mg/kg (PAP-00425863). The KTP-1 area was located approximately 15 feet southwest of the northwest corner of the Goody building (PAP-00425821).

A summary of analytical results for the TP-31 Area listed concentrations of copper ranging from 56.3 mg/kg to 498 mg/kg (PAP-00425864). The TP-31 area was located in the west yard (PAP-00425797).

A summary of analytical results for the SB-5 Area listed concentrations of lead ranging from 200 mg/kg to 353 mg/kg (PAP-00425868). The SB-5 area was located in the west yard (PAP-00425798).

A summary of analytical results for the TP-67 Area listed concentrations of lead ranging from 208 mg/kg to 323 mg/kg (PAP-00425869). The TP-67 area was located in the west yard (PAP-00425798).

A summary of analytical results for the Central West Yard - PHC Impacted Area and Former Hazardous Waste Storage Area listed the following concentrations:

Remedial Action Report Samples		
COC	**Concentration Ranges**	**Depth of Max**
Benzo(a)anthracene	0.920 mg/kg – 5.600 mg/kg	2.5-3.0 ft.
Benzo(a)pyrene	1.000 mg/kg – 6.200 mg/kg	2.5-3.0 ft.
Benzo(b)fluoranthene	1.400 mg/kg – 7.700 mg/kg	2.5-3.0 ft.
Benzo(g,h,i)perylene	0.340 mg/kg – 2.900 mg/kg	2.5-3.0 ft.
Benzo(k)fluoranthene	0.480 mg/kg – 2.800 mg/kg	2.5-3.0 ft.
Dibenzo(a,h)anthracene	0.110 mg/kg – 0.780 mg/kg	2.5-3.0 ft.
Indeno(1,2,3-cd)pyrene	0.370 mg/kg – 3.000 mg/kg	2.5-3.0 ft.

(PAP-00425867)

Sediment removal activities in Dead Horse Creek were conducted in 1999. Visual observations during the sediment removal effort noted the presence-of fill material during the sediment removal activities. Hatch Mott MacDonald collected post-remedial sediment samples from the base of the Dead Horse Creek and analytical results from the sampling revealed the presence of metals in excess of nonresidential soil remediation standards in place at that time. However, a comparison of the March 1996 and February 1999 sampling events revealed a dramatic decrease in the concentrations of contaminants detected in samples from stream sediment. Killam Associates concluded that the sediment removal undertaken at Dead Horse Creek substantially reduced the overall contaminants present in the stream corridor (PAP-00104787).

According to a May 2001 *Surface Water and Groundwater Evaluation Summary Report* prepared by Killam Associates for Newell Company, an investigation was conducted by Killam Associates in 2000-2001 to evaluate the Site surface water and groundwater (PAP-00104829-35). Five surface water samples were collected from Dead Horse Creek on September 20, 2000, to assess the potential for impacts from the presence of the Historic Fill and/or contaminants in soil. The samples were collected from representative locations upstream, midstream and downstream and were located approximately 100 feet apart. Lead and mercury were detected in surface water samples at concentrations in excess of the corresponding NJDEP Surface Water Quality Criteria of 5 µg/L and 0.144 µg/L, respectively. Lead was detected at the following concentrations: 13.6 µg/L in sample DownStream-1, 10.4 µg/L in sample DownStream-2, 16.3 µg/L in MidStream-3, 15.7 µg/L in sample Upstream-4, and 15.4 in UpStream-5. Mercury was detected at 0.25 µg/L in sample DownStream-1, 0.16 µg/L in DownStream-2, and 0.15 µg/L in MidStream-3. In addition, eighteen groundwater wells were sampled. Lead was detected in excess of the NJDEP Groundwater Quality Standard (GWQS) (10 µg/L) in groundwater samples from three shallow wells and one deeper well (PAP-00104829-97).

During 2007 and 2009, a follow-on Remedial Investigation was conducted in order to further delineate remaining areas of concern at the Site in preparation for the assignment of a Classification Exception Area for groundwater and site-wide Deed Notice to address Historic Fill. According to a Remedial Investigation Report dated July 2009 prepared by Hatch Mott MacDonald for Goody Products, the investigation included additional soil delineation and sampling in the area of the WWTP Discharge Pit (AOC 1), additional soil investigation in the area of the Compressor Blowdown Pipe/Test Pit TP-75 Area (AOC 3E) and the installation of six monitoring wells and performance of groundwater sampling to investigate groundwater conditions at the Site (PAP-00104765-73). The majority of the investigation involved hexavalent chromium, arsenic, ethylbenzene, total xylenes, and nickel. However, elevated concentrations of metals above the NJDEP GWQS which included lead were also detected at the western portion of the Site. Lead was detected at concentrations of 170 µg/L (MW-10S), 55 µg/L (MW-13), and 10 µg/L (MW-15); exceeding the GWQS of 5 µg/L (PAP-00104783-801 Note that the available references did not provide conclusive information regarding groundwater flow patterns at the site or specific information regarding the potential connection of groundwater to the Dead Horse Creek or to other potential pathways connected to the Passaic River.

On February 28, 2012, a Deed Notice was issued for the property at 969 Newark Turnpike (this site) because soil contamination remained in certain areas of the property which contains contaminants in concentrations that do not allow for the unrestricted use of the property. Due to the presence and concentration of these contaminants resulting from Historic Fill, restrictions regarding the use of the property, and the placement of capping over the ground as an engineering control were instituted. The restriction against subsurface intrusion included the entire 9.55-acres of the property (PAP-00104217-56). According to an April 2012 NJDEP Remedial Action Permit Application – Soil, the contaminants and the concentrations which required the Deed Notice included the metals copper (1,320 mg/kg, depth of 0 to 0.5 feet) and lead (1,780 mg/kg, depth of 2.0 to 2.5 feet); and PAHs benzo(a)anthracene (19 mg/kg, depth of 4.5 to 5.0 feet), chrysene, (19 mg/kg, depth of 4.5 to 5.0 feet), benzo(b)fluoranthene (20 mg/kg, depth of 4.5 to 5.0 feet), benzo(k)fluoranthene (8.4 mg/kg, depth of 4.5 to 5.0 feet), benzo(a)pyrene (16 mg/kg, depth of 4.5 to 5.0 feet), indeno(1,2,3-cd)pyrene (12 mg/kg, depth of 4.5 to 5.0 feet), and dibenzo(a,h)anthracene (2.7 mg/kg, depth of 4.5 to 5.0 feet) (PAP-00104212-4).

On April 25, 2012, NJDEP issued Remedial Action Soil Permit No. RAP120002 requiring Goody Products to conduct monitoring, maintenance and evaluation for compliance and effectiveness of the remedial action, and the associated institutional and engineering controls (PAP-00104269-76). In addition, on April 26, 2012, NJDEP issued a Conditional No Further Action Letter stating that as long as each subsequent owner, lessee, and operator of the Site complied with the conditions of the Remedial Action Soil Permit then no further remedial action would be required (PAP-00104419-21). The remediation that was covered by this Conditional No Further Action Letter did not address the remediation of hazardous substances that may exist in building interiors or equipment; including, but not limited to, lead. As a result, any risks to human health presented by any building interior or equipment remained (PAP-00104421).

In a letter dated April 25, 2015, NJDEP established a Classification Exception Area/Well Restriction Area for lead and other metals contamination in the groundwater above the NJDEP GWQS at the Goody Products Site, which may limit the groundwater use at the Site. The maximum concentration of lead detected at the site was 2,070 µg/L (PAP-00104257-62; PAP-00104483-500).

On March 13, 2018, a Soil Remedial Action Permit Modification (RAP170001) was issued by NJDEP. RAP170001 superseded RAP130001, which presumably superseded RAP120002. The permit modification requires the permittee to conduct monitoring, maintenance and evaluation for compliance and effectiveness of the remedial action and its associated institutional control. The permit modification established requirements necessary for demonstrating that the remedial action and control continue to be protective of public health, safety and the environment (PAP-00104518-19).

8. Summary of Asserted Defenses

Neither Newell nor Goody Products, Inc. ("Goody") is a "covered person" (i.e., a responsible party) under CERCLA Section 107(a), 42 U.S.C. § 9607(a), with respect to the Diamond Alkali Superfund Site, including because Newell and Goody (a) do not, and never did, own or operate any portion of the Site; (b) did not arrange for the disposal of any hazardous substances at the Site (including because neither discharged any hazardous substances from the Facility to the Lower Passaic River); and (c) did not transport any hazardous substances to the Site.

Some or all of Goody's releases of hazardous substances to the Lower Passaic River, if any, were "federally permitted releases" within CERCLA Section 107(j), 42 U.S.C. § 9607(j), and resulting response costs or damages, if any, may not be recovered under CERCLA.

Pursuant to CERCLA Section 107(b), 42 U.S.C. § 9607(b), Newell and Goody are not liable for the releases or threatened releases of hazardous substances from the Facility, if any, because such releases or threatened releases were caused solely by: an act of God; an act of war; or the acts or omissions of persons or entities other than Newell or Goody, for whom Newell and Goody are not responsible.

Each release or threat of release of hazardous substances, if any, and any costs or damages resulting there from was caused solely by the negligence, acts or omissions of third-parties over whom Newell and Goody had no control and no duty to control, including without limitation: (a) the State of New Jersey and its agencies, instrumentalities and officials, including, without limitation, Trustees for tidelands; and (b) the United States and its agencies, instrumentalities and officials.

Neither Newell nor Goody is a successor to any person or entity that owned or operated any portion of the Facility property.